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UNIVERSITY OF NIGERIA, NSUKKA

POST UTME PAST QUESTIONS FOR FACULTY OF ENGINEERING
AND PHYSICAL SCIENCE

UNN POST-UTME PAST QUESTIONS FOR FACULTY OF ENGINEERING & PHYSICAL SCIENCES

2005/2006 USE OF ENGLISH QUESTIONS (SESSION 1)

COMPREHENSION

INSTRUCTION: Read the passage carefully and answer the questions that follow.

Developments in electronic science have transformed the art of record-keeping in the modern age. Traditionally, records of events were kept only in people's minds. It depended very much on the retentive power of the human memory.

This was extremely dangerous as people either forgot events wholly or in part, or deliberately falsified details to suit their various interests. Interminable arguments were thus the order of the day. Even writing which replaced mental recording was not entirely free from these shortcomings as untruths could be written as true records either willingly or inadvertently. With the advent of the electronic memory, however, these dangers now show not only what happened, but also who did or said what, including how and when.

- The author believes that electronic recording is _____.
 - superior to mental recording.
 - inferior to both mental recording and writing.
 - superior to both mental recording and writing.
 - inferior to only writing.
- The writer believes that the art of record keeping has _____.
 - improved over the years
 - endangered the art of writing
 - changed human memory.
 - overcome all the problems facing it
- How many stages of development did the writer mention while discussing the art of record keeping?
 - Two
 - Three
 - Four
 - Five

- According to the author, human memory is unreliable because people _____.
 - die and we forget what they said
 - forget events or tell lies
 - do not always know when events happen
 - do not always know who did what and when

- From the passage, we gather that writing is almost
 - as unreliable as human memory
 - as reliable as electronic memory
 - more reliable than electronic recording
 - not to be compared to any other recording systems

LEXIS AND STRUCTURE

In questions 6 and 7, select the option that best explains the information conveyed in the sentence.

- You are driving too fast for safety.
 - That speed is all right and safe
 - That speed is not fast enough for safety
 - That speed is not entirely safe
 - You should drive faster to ensure safety
- For all I care, the man may be dead.
 - I am not sure that the man is dead
 - I am not interested in his death
 - I very much care in case he is dead
 - I am ignorant of the man's death.

In each of questions 8-11, choose the most appropriate option opposite in meaning to the words in italics.

- The priest was invited to *consecrate* the new building.
 - destroy
 - abuse
 - tarnish
 - pollute
- A majority of those who sat for the last jamb examination are *sanguine* of success.
 - hopeful
 - unsure
 - pessimistic
 - disheartened

10. When we woke up this morning, the sky was *overcast*.

- A. cloudy
- B. clear
- C. shiny
- D. brilliant

11. Enemies of progress *covertly* strive to undermine the efforts of this administration.

- A. secretly
- B. boldly
- C. consistently
- D. overtly

In each of questions 12-15, fill the gap with the most appropriate option from the list following gap.

12. The boy is constantly under some that he is the best student in the class.

- A. elusion
- B. delusion
- C. illusion
- D. allusion

13. Her parents did not approve of her marriage two years ago because she has not reached her _____.

- A. maturity
- B. puberty
- C. majority
- D. minority

14. Our teacher _____ the importance of reading over our work before submission.

- A. emphasized on
- B. emphasized
- C. layed emphasis on
- D. put emphasis

15. Young men should not get mixed _____ politics.

- A. in with
- B. up with
- C. up in
- D. on with

ENGLISH 2005/2006 ANSWERS [SECTION ONE]

1. C 2. A 3. B 4. B 5. A 6. C 7. B 8. D 9. C

10. C 11. D 12. B 13. C 14. B 15. C

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ENGLISH 2005/2006 QUESTIONS [SESSION 2]**COMPREHENSION**

INSTRUCTION: Read the passage carefully and answer the questions that follow.

The market was old, timeless Africa, loud, crowded and free. Here, a man sat making sandals from old discarded motor-car tyres; there another worked at an old sewing machine, making a nightgown-like affair while the buyer.

waited; a little further on, an old goldsmith worked at his dying art, but using, now, copper filings instead of gold) to fashion the lovely trinkets women wear the world over; elsewhere a woman sold country cloth fashioned with such fine art that only Africans think of it as a garment of utility. Trade was slow and loud everywhere. This was as much a social as a shopping centre. For an excuse to spend the day at the market, a woman would walk all the way from her village to town with half a dozen eggs. She would spread them on a little bit of ground for which she paid rent. Through the day she would squat on the ground and talk to others who came for the same reason. She would refuse to sell her wares till it was time to leave. They were the excuse for her being there. There were many like that. But there were many others for whom trade was an earnest business. Whether in earnest or as an excuse, the traders were boisterously free, loud-mouthed and happy. The laughter of the market was a laughter found nowhere else in all the world.

1. According to the passage, the woman with half a dozen eggs in the market _____.
 A. is doing earnest business.
 B. comes purposely to enjoy herself.
 C. is like other traders in the market.
 D. does not like her husband at home.

2. "An old goldsmith worked on his dying art" means that the
 A. goldsmith's trade was no longer popular
 B. goldsmith was old and must soon die
 C. goldsmith knew well the art of dying
 D. goldsmith now used copper filings

3. Which of the following titles BEST reflects the content of the passage?

- A. Market scene
- B. An African market scene
- C. Trading in the market
- D. An African shopping centre

4. Which of the following statements BEST illustrates the impression the writer has created about the market?

- A. An old, timeless and scantily populated place.
- B. A place people come to for business or pleasure.
- C. An old, crowded and discarded place.
- D. A place for all types of wares and laughter.

5. Which of the following groups of items may be found for sale in the market?

- A. Motorcar tyres, eggs and gold trinkets
- B. Eggs, sandals and gold trinkets
- C. Country cloth, gold trinkets and sandals
- D. Country cloth, copper trinkets and eggs

LEXIS AND STRUCTURE

In each of questions 6-9, choose the option nearest in meaning to the word or phrase in italics.

6. Much of his *chagrin*, he did not win the race.

- A. stupefaction
- B. disappointment
- C. shock
- D. surprise

7. Traditional rulers are not supposed to be involved in *partisan* politics.

- A. dirty
- B. party
- C. modern
- D. surprise

8. Mr. Adamu is a *dominant* partner in our business.

- A. a prominent
- B. an important
- C. an outstanding
- D. an influential

9. The patient *disregarded* the advice of the doctor.

- A. ignored
- B. disobeyed

- C. questioned
- D. respected

In each of questions 10-12, fill the gap with the most appropriate option from the list following the gap.

10. The lawyer pleaded-with the judge to _____ justice with mercy.
- A. tempar
 - B. temper
 - C. tamper
 - D. taper
11. So far, no... [A. effected B. efficient C. efficacious D. effectual] drug has been discovered as a cure for the AIDS diseases.
12. The student leaders were _____punished.
- A. unduly
 - B. undully
 - C. unduely
 - D. unduely

In each of questions 13-14, choose the word that has the same consonant sound as the one represented in the letter underlined.

13. Vision
- A. Mansion
 - B. Profession
 - C. Cession
 - D. Precision
14. Chair
- A. Chancellor
 - B. Chiffon
 - C. Chalet
 - D. Champaign

In the following question, the words in capital letters have the emphatic stress. Choose the option that best fits the expression in the sentences.

15. The secretary enjoys travelling AT NIGHT.
- A. Did the secretary enjoy travelling by day
 - B. Does the secretary enjoy travelling by day
 - C. Who enjoys travelling by night
 - D. Does the secretary hate travelling at night

USE OF ENGLISH 2005/2006 SECTION TWO ANSWERS

1. B 2. A 3. B 4. B 5. D 6. B 7. B 8. B 9. A
10. B 11. C 12. A 13. D 14. A 15. B

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2005/2006 MATHEMATICS QUESTIONS

1. Find n if $314_{10} - 256_7 = 340_n$

- A. 7
- B. 8
- C. 9
- D. 10

2. What is the difference between 1.867551 correct to four significant figures and 1.867551 correct four decimal places?

- A. 5×10^{-1}
- B. 4×10^{-4}
- C. 5×10^{-4}
- D. 10×10^{-3}

3. In an examination, all the candidates offered at least one of English and French, if 52% offered French and 65% offered English, what percentage offered French only?

- A. 17%
- B. 35%
- C. 4%
- D. 45%

4. Simplify $\frac{6x^3+5x^2-8x}{2x^2+x-3}$

- A. $3x-1$
- B. $1-3x$
- C. $3x+1$
- D. $-(3x+1)$

5. Find the range of values of x satisfying the inequalities $2x - 5 < 7$ and $25 + 2x > 15$

- A. $5 < x < 6$
- B. $-5 < x < 6$
- C. $-6 < x < 5$
- D. $-6 < x < -5$

6. If the 8th term of an A.P is three times the second term and the sum of the first three terms is 18, find the first term of the A.P.

- A. 4
- B. 2
- C. 8
- D. 3

7. Find the sum to infinity of the series $4 + 3 + \frac{9}{4} + \frac{27}{16} + \dots$

- A. 16
- B. $\frac{16}{3}$
- C. 1
- D. 8

8. A chord of a circle of radius 10cm is drawn 8cm from the centre of the circle. Find the length of the chord.

- A. 6 cm
- B. $2\sqrt{41}$ cm
- C. 12cm
- D. $\sqrt{41}$ cm

9. Find the equation of the line which passes through $(-2, 1)$ and is perpendicular to the line $4x-2y+1=0$

- A. $2y - x - 4 = 0$
- B. $2y+x = 0$
- C. $2y-x = 0$
- D. $y - 2x-5 = 0$

10. If a line is parallel to the line $2y - rx + 4 = 0$ and perpendicular to the line $4y + x - 28 = 0$ then the value of r is

- A. 4
- B. 8
- C. -8
- D. -4

11.

Score	0	1	2	3	4	5
No of Student	2	8	14	16	12	8

The distribution above shows the scores of sixty students in a class test. What percentage of the students scored at least 3?

- A. 60%
- B. 36%
- C. 66%
- D. 40%

12. The first derivative of $y = (2 + 3x)^4$ at $x = -1$ is

- A. 12
- B. -12
- C. 4
- D. -4

13. The minimum value of $(x) = x^2 - 4x + 5$ in the interval $[1, -1]$ is

- A. 12
- B. -12
- C. 4
- D. -4

14.

Score	1	2	3	5	6
Frequency	3	6	7	x	4

The table above shows the marks scored by a group of students in a class test. If the mean score is 3.4, find x.

- A. 3
- B. 4
- C. 5
- D. 2

15. A company is to select three different handset phones from five different types of Nokia brand and two different types of Samsung brand. In how many ways can the company choose the handsets, so as to include at least one Samsung brand?

- A. 15
- B. 25
- C. 35
- D. 45

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ANSWERS TO MATHEMATICS 2005/2006

1. A 2. B 3. B 4. C 5. B 6. A 7. A 8. C 9. B
10. B 11. A 12. B 13. A 14. C 15. B

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2005/2006 PHYSICS QUESTIONS

1. Which of the following represents the correct precision if the length of a piece of wire is measured with a meter rule?

- A. 35mm
- B. 35.0mm
- C. 35.00mm
- D. 35.01mm

2. To keep a vehicle moving at a constant speed V requires power P , from the engine. The force provided by the engine is

- A. P/V
- B. $V/2$
- C. PV
- D. P^2/V

3. Which of the following statements give the TRUE difference between evaporation and boiling?

- I. Evaporation occurs at all temperatures while boiling occurs at a fixed temperature for a given pressure
- II. Evaporation is a surface phenomenon while boiling is an interior phenomenon
- III. Evaporation is affected by surface area while boiling is not

- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II and III only

4. Equal masses of copper and rubber are raised to the same temperature. After sometime, the copper was observed to be at a lower temperature because _____

- A. the specific heat capacity of copper is lower than that of rubber.
- B. copper expands more than rubber.
- C. the specific heat capacity of rubber is lower than that of copper.
- D. rubber expands more than copper.

5. Which of the following statements is correct about a long-sighted boy who does not put on glasses?

- A. He cannot see distant objects clearly
- B. Rays of light from a close object are focused in front of the retina
- C. His eyeball is too long

6. A 12V battery has an internal resistance of 0.5Ω . If a cable of 1.0Ω resistance is connected across the terminals of the battery, the current drawn from the battery is

- A. 16.0A
- B. 8.0A
- C. 0.4A
- D. 0.4 A

7. If two parallel wires carry currents flowing in the same direction, the conductors will

- A. attract each other
- B. repel each other
- C. both move in the same direction
- D. have no effect on each-other

8. From the generating station to each sub-station, power is transmitted at a very high voltage so as to reduce

- A. eddy current loss
- B. hysteresis loss
- C. heating in the cable
- D. magnetic flux leakage

9. Two tuning forks of frequencies 256Hz and 260 Hz are sounded close to each other.

What is the frequency of the beats produced?

- A. 516Hz
- B. 258Hz
- C. 4 Hz
- D. 300Hz

10. The fundamental frequency of vibration of a sonometer wire may be halved by A.

- A. doubling the length of the wire
- B. doubling the mass of the wire
- C. 240V
- D. 60V

11. A transformer has a primary coil with 500 turns and a secondary coil with 2500 turns and a secondary coil with 2500 turns. When the voltage input to the primary is 120V, the output is _____.

- A. 6000 V
- B. 600 V
- C. 240 V
- D. 60 V

12. The principle of operation of an induction coil is based on

- A. Ohm's law
- B. Ampere's law
- C. Faraday's law
- D. Coulomb's law

13. 4g of radioactive material of half-life 10days is spilled on a laboratory floor. How

long would it take to disintegrate 3.5g of the material?

- A. 11/4 days
- B. 8 1/4 days
- C. 30 days
- D. 80 days

14. Which of the following statements correctly describe(s) cathode rays?

- I. They consist of tiny particles carrying negative electric charges
 - II. They are deflected in a magnetic field but not in an electric field
 - III. They consist of fast-moving neutrons and are deflected in an electric field
- A. I only
 - B. II only
 - C. I and II only
 - D. II and III only

15. Which of the following is most strongly deflected by a magnetic field?

- A. γ -rays
- B. α -rays
- C. β -particles
- D. X-rays

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ANSWERS TO PHYSICS 2005/2006 QUESTIONS

1. B 2. A 3. B 4. A 5. D 6. B 7. A 8. C 9. C
10. A 11. B 12. C 13. C 14. A 15. C

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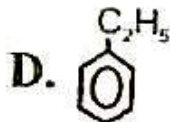
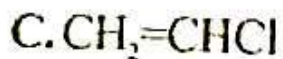
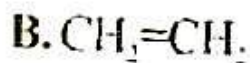
CHEMISTRY 2005/2006 QUESTIONS

- Which of the following is a mixture?
 - Sodium chloride
 - Sea water
 - Iron filings
 - Granulated sugar
- Two elements, X and Y, have atomic numbers E and 13 respectively. The formula for the possible compound found between X and Y is
 - Y_2X_2
 - XY_2
 - X_3Y_2
 - X_2Y_3
- 3g of a mixture of CaO and $CaCO_3$ was heated to constant mass. If 0.44g of CO_2 was liberated, calculate the percentage of CaO in the mixture.
 - 33.3%
 - 50%
 - 66.67%
 - 25%
- An alkanic acid has a molecular mass of 88. Its molecular formula is
 - C_4H_9COOH
 - $C_5H_{11}COOH$
 - C_3H_5COOH
 - C_3H_7COOH
- If the rate of diffusion of oxygen is taken as 1 cm s^{-1} , what will be the rate of diffusion of methane whose relative molecular mass is 16?
 - 2.0
 - 1.8
 - 1.4
 - 1.0
- An increase in temperature causes an increase in the pressure of a gas in a fixed volume due to an increase in the
 - Number of molecules of the gas
 - Density of the gas molecules
 - Number of collisions between the gas molecules
 - Number of collisions between the gas molecules and the walls of the container
- In electrolysis, the chemical reaction which takes place at the anode is
 - dissociation
 - hydrolysis
 - oxidation
 - reduction
- In the electrolysis of brine, it is essential to prevent the mixing of the products because
 - sodium and chlorine readily combine
 - chlorine gives a green coloration
 - chlorine readily recombines with sodium hydroxide
 - sodium hydroxide forms a carbonate in the presence of air and chlorine
- In what way is equilibrium constant for the reaction related to that of the reverse reaction?
 - The two equilibrium constants are identical
 - The product of the two is always greater than one
 - The product of the two is expected to be one
 - The addition of the two is expected to be one
- When chlorine water is exposed to sunlight, the gas evolved is
 - Cl_2
 - O_2
 - HCL
 - CO_2
- $PbCl_2$ does not dissolve in liquid ammonia while AgCl does. This is because
 - Pb is not a transition metal while Ag is
 - Ag is not a transition metal while Pb is
 - AgCl turns grey on exposure to light
 - AgCl dissolves in hot water
- When sodium hydroxide pellets are exposed to the atmosphere, the first gas they absorb is
 - CO_2
 - Water vapour
 - Oxygen
 - Nitrogen
- What is the IUPAC name of the hydrocarbon?

$$\begin{array}{ccccccc}
 CH_3 & - & C & = & CH & - & CH & - & CH_3 \\
 & & | & & & & | & & \\
 & & CH_2 & & & & CH_3 & & \\
 & & | & & & & & & \\
 & & CH_3 & & & & & &
 \end{array}$$

- A. 2-ethyl-4-methyl pent-2-ene
- B. 3,5 dimethyl hex-3-ene
- C. 2,4-dimethyl hex-3-ene
- D. 3-methyl 2-ethyl hex-2-ene

14. Which of the following is NOT a monomer?



15. Which of the following behaves like ethyne?

- A. $\text{CH}_3\text{CH}=\text{CHCH}_3$
- B. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}=\text{CH}_2$
- C. $\text{CH}_2=\text{CH}_2$
- D. CH_3CH_3

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ANSWERS TO CHEMISTRY 2005/2006

1. A 2. B 3. C 4. D 5. C 6. D 7. C 8. D 9. C
10. B 11. A 12. A 13. C 14. A 15. C

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USE OF ENGLISH 2006/2007 QUESTIONS

COMPREHENSION

INSTRUCTION: Read the passage carefully and answer the questions that follow.

The approach to the university is being restructured to ease the flow of traffic, give better security and provide an appropriate introduction to a seat of higher learning. The Works and Services Complex is also under construction, and we intend to move into the completed (major) part of it within the next few weeks.

All these projects are being executed with an eye to aesthetics, for we recognize the important influence of a beautiful and healthy environment on its inhabitants and feel that a cluster of buildings on a small space such as we have, should be so well designed as to have a beneficial psychological and sociological effect on all members of the community.

I have gone to these lengths to itemize these examples of current development for two main reasons. Firstly, to advise you that the road diversions and other physical inconveniences currently being experienced will be on the increase because of intense development activity. We therefore appeal to you to bear with us in full knowledge and consolation that such inconveniences are temporary and will soon yield final tangible results. Secondly, to demonstrate our capacity for executing approved projects with dispatch. and to assure Government that we are up to the task. Indeed. I can assure Government that its ability to disburse funds to us will be more than matched by our capacity to collect and expend them on executing various worthy projects in record time.

1. From the passage, we can gather that
- there is not much consideration for the of the inhabitants
 - there is deliberate effort to inconvenience the people
 - buildings are put up anyhow
 - projects are carried out without approval
 - the inconveniences suffered by inhabitants will be for a while

2. Unless it can be shown that money voted for projects can be spent on them in good time.

- the development activity will not be intense
- it will not be easy to convince the government of our executive ability
- it will not be difficult to ask government for funds
- our final result will be unreliable
- the road diversions and other inconveniences will continue

3. An eye on aesthetics in this passage means _____.

- regard for space
- beneficial psychological effects
- regard for health
- consideration for beauty
- a cluster of buildings

4. In this passage, the author tries to explain why.

- it is necessary to establish the Works and Services Complex in the University
- beauty should not be taken into consideration when building on such a small space as we have
- the gateway to the university is being rebuilt
- a major part of the project should be completed in the next few weeks
- visitors should be debarred from using the gates in the meantime

5. Which of these is NOT among the reasons given by the author for enumerating the examples of the current development?

- To show that we are capable of executing approved projects
- To convince the government that we can be trusted with tasks
- The inconvenience currently being experienced will go on indefinitely.
- We are fully aware of the inconveniences being caused but we do not want you to complain.
- We have the capacity to complete worthy projects within the scheduled time.

In each of questions 6-15, fill the gap with the most appropriate option from the list following the gap.

6. Some smugglers have created a road diversion in order to _____ the new import duty.

- A. circumflex
- B. circumscribe
- C. circumspect
- D. circumvent

7. It happened that our dog is male but ... are all females.

- A. their's
- B. there's
- C. theirs'
- D. theirs

8. We can use the telephone; the lines are all _____.

- A. on
- B. off
- C. up
- D. down

9. Ayayi cashed _____ our boy's defensive error to score the equalizer. A. on

- B. in with
- C. in on
- D. in

10. I heard that Italy's victory at the world cup _____ the radio.

- A. in
- B. on
- C. over
- D. from

11. He travels very often as if he does not know that a car runs _____ Petrol. A. with

- B. by
- C. on
- D. in

12. We were all delighted when the lady _____ a bouncing baby boy.

- A. delivered
- B. brought forth
- C. gave birth to
- D. was delivered of

13. Although the problem was simple, _____ student were able to solve it.

- A. few
- B. a few
- C. a lot of
- D. little

14. Some students _____ believed they can succeed in exams without working hard.

- A. many a times

- B. many at time
- C. many a time
- D. many at times

15. The defendant claimed that he had been _____ making a statement.

- A. coarced
- B. coaxed
- C. coarsed
- D. coerced

USE OF ENGLISH 2006/2007 ANSWERS

1. E 2. B 3. D 4. D 5. C 6. D 7. D 8. A 9. C

10. B 11. C 12. D 13. A 14. C 15. D

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PHYSICS 2006/2007 QUESTIONS

Indicate the correct option in each of the following questions

1. Which of the following is a set of vectors?

- A. force, mass and momentum
- B. acceleration, velocity and momentum
- C. mass, weight and density
- D. mass, volume and density

2. A catapult used to hold a stone of mass 500g is extended by 20cm with an applied force, F. If the stone leaves with a velocity of 40m/s, the value of F is

- A. $4.0 \times 10^2 \text{ N/m}^2$
- B. $2.0 \times 10^3 \text{ N}$
- C. $4.0 \times 10^3 \text{ N}$
- D. $4.0 \times 10^4 \text{ N}$

3. A parachute attains terminal velocity when

- A. its density is equal to the density of air
- B. the Viscous force of air and up thrust completely counteract its weight
- C. it expands as a result of reduced external pressure
- D. the viscous force of the air is equal to the sum of the weight and upthrust

4. An electrical heater is used to melt a block of ice, mass 1.5kg, If the heater is powered by a 12V battery, and a current of 20A flows through the coil, calculate the time taken to melt the block of ice at 0°C . (specific latent heat of fusion of ice = $336 \times 10^3 \text{ J/kg}$)

- A. 76.0 min
- B. 35.0 min
- C. 21.0 mn
- D. 2.9 min

5. 200g of water at 90°C is mixed with same quantity of water at 30°C . What is the final temperature?

- A. 50°C
- B. 60°C
- C. 70°C
- D. 80°C

6. The equation $P^x V^y T^z = \text{constant}$ is Charles law when

- A. $x=1, y=1, z=1$
- B. $x=0, y=1, z=1$
- C. $x=1, y=0, z=1$
- D. $x=0, y=1, z=1$

7. For short-sighted person, light rays from a point on a very distant object is focused

- A. in front of the retina
- B. behind the-retina
- C. behind the retina by a diverging lens
- D. in front of the, retina a distance 2F from the lens

8. Dispersion of light by a glass prism is due to the

- A. different hidden colours of the glass
- B. different speeds of various colours in glass
- C. defect in the glass
- D. high density in glass

9. To produce an enlarged and erect image with a concave mirror, the object must be positioned

- A. between the principal focus and the centre of curvature
- B. at the principal focus
- C. between the principal focus and the pole
- D. beyond the centre of curvature

10. To convert an ac dynamo to dc dynamo, the

- A. number of turns of the coil is increased
- B. slip rings are replaced with a split-ring commutator
- C. number of turns of the" coil is reduced
- D. split-ring commutator is replaced with slip rings

11. In an AC circuit that contains only a capacitor, the voltage

- A. lags behind the current by 90°
- B. leads the current by 90°
- C. lags behinds the currents by 180°
- D. leads the current by 180°

12. The purpose of dielectric material in a parallel plate capacitor is to

- A. increase the capacitance
- B. decrease its capacitance
- C. insulate the plates from each other
- D. increase the magnetic field between plate

13. A substance has a half-life of 3min. After 6m the count rate was observed to be 600. What its count rate at zero time?

- A. 200
- B. 1200
- C. 1600
- D. 2400

14. If light with photon energy 2eV is incident on the surface of a metal with work function 3eV , then

- A. no electron will be emitted
- B. the few electrons emitted will have maximum kinetic energy of 1eV
- C. the few electrons emitted will have a maximum kinetic energy of 3eV
- D. many electrons will be emitted with maximum kinetic energy of 5eV

15. In a nuclear fusion experiment, the loss of mass amounts to $1.0 \times 10^{-6} \text{ kg}$. The amount of energy obtained from the fusion (speed of light = $3.0 \times 10^8 \text{ m/s}$) is

- A. $3.0 \times 10^{-4} \text{ J}$
- B. $3.0 \times 10^{-4} \text{ J}$
- C. $9.0 \times 10^{-4} \text{ J}$
- D. $9.0 \times 10^{10} \text{ J}$

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ANSWERS TO PHYSICS 2006/2007

1. B 2. B 3. B 4. B 5. B 6. B 7. A 8. B 9. D
10. B 11. A 12. A 13. D 14. A 15.

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CHEMISTRY 2006/2007 QUESTIONS

1. A mixture of iron and sulphur can be separated. by dissolving the mixture in

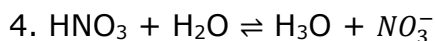
- A. Steam
- B. Dilute hydrochloric acid
- C. Dilute sodium hydroxide
- D. Benzene

2. If 67.5g of oxide of lead was reduced to 61.2g of metal, calculate the formula of the oxide. (Pb = 207, O = 16)

- A. PbO
- B. PbO₃
- C. Pb₃O₄
- D. Pb₂O₃

3. Calculate the minimum volume of the oxygen that is required for complete combustion of a mixture of 20 cm³ of CO and 10 cm³ of hydrogen.

- A. 5 cm³
- B. 10 cm³
- C. 15 cm³
- D. 20 cm³



In the reaction above, NO_3^- is the

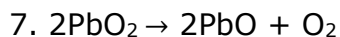
- A. Conjugate acid
- B. Acid
- C. Conjugate base
- D. Base

5. The pH range of a neutralization product of CH₃COOH and KOH is

- A. 1 - 3
- B. 7 - 8
- C. 6 - 7
- D. 12 - 14

6. How much NaOH is required to make 250 cm³ of 0.1 mol/dm³ solution?

- A. 10g
- B. 1.0g
- C. 0.1g
- D. 4g



In the equation above, the oxidizing agent is

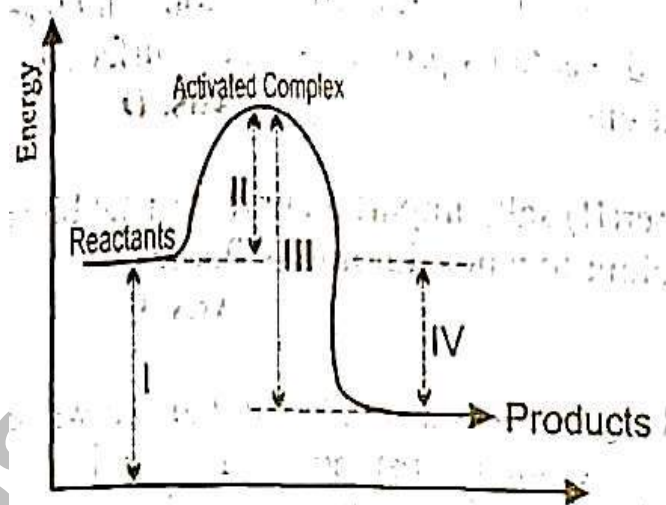
- A. Pb⁴⁺
- B. Pb²⁺
- C. O²⁻
- D. O₂

8. A current of 0.5 A flows for 1930 seconds and deposits 0.325 g of metal M. If the charge is +2, the relative molecular mass is

- A. 65 g
- B. 32 g
- C. 24 g
- D. 40 g

9. Emission of chlorofluorocarbon (CFC) into the atmosphere causes

- A. global warming
- B. acid rain
- C. depletion of ozone layer
- D. greenhouse effect



10. The diagram above shows the reaction path of an exothermic reaction. The heat of reaction is represented by

- A. I
- B. II
- C. III
- D. IV

11. Which of the following samples will react fastest with dilute HCL?

- A. 10 g of lumps of CaCO₃ at 25°C
- B. 10 g of powdered CaCO₃ at 25 °C
- C. 10 g of lumps of CaCO₃ at 50 °C
- D. 10 g of powdered CaCO₃ at 50 °C

12. The colour exhibited by copper in a flame test is

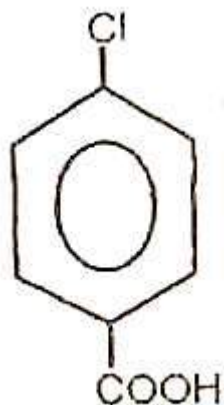
- A. green
- B. lilac
- C. blue-green
- D. crimson

13. Which of the following statements is correct?

- A. Chlorine bleaches by oxidation while sulphur(IV) oxide bleaches by reduction
- B. Chlorine bleaches by reduction while sulphur(IV) oxide bleaches by oxidation

- C. Both of them bleach by oxidation
- D. Both of them bleach by reduction

14. The IUPAC name for is



- A. 1-chlorobenzoic acid
- B. 3-chlorobenzoic acid
- C. M-chlorobenzoic acid
- D. P-chlorobenzoic acid

15. 3-methylbutan-2-one is an isomer of

- A. Pentanal
- B. 3-methylpentan-2-one
- C. Hex-3-ene
- D. 2-methylprop-1-ene

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ANSWERS TO CHEMISTRY 2006/2007

1. D 2. C 3. C 4. C 5. D 6. B 7. A 8. A 9. C
10. D 11. D 12. C 13. A 14. A 15. A

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USE OF ENGLISH 2007/2008 QUESTIONS

COMPREHENSION

INSTRUCTION: Read the passage carefully and answer questions 1-5 below.

Olumba removed a small black amulet from his neck and substituted a bigger one. The former was for general protection at home, the latter for protection and luck whilst travelling. Ready at last he picked up his matchet and headed for the chief's house with Ikechi behind him.

Olumba walked ahead looking upward as usual. Just what he was searching for in the sky Ikechi couldn't tell. Perhaps, his shortness accounted for this habit since he often had to look up into the faces of his taller companions. What he lacked in height he made up in solid muscle and he looked strong. His wrestling pseudonym was Agadaga, a name which meant nothing but which somehow conveyed an impression of strength.

Eze Diali, the chief, sat at one end of his reception hall ringed by the village elders whom he had called to a meeting. The rest of the hall was filled with much younger men.

"People of Chiolu," the chief began, "I have learnt that poachers from Aliakoro 'will be at the Great Ponds tonight. There is no doubt that they will try to steal from the Pond of Wagaba which as you know is rich in fish. Our plan tonight is to bring one or more of these thieves home alive and ask for very large ransoms. This line of action will have two effects. Firstly, it will prove our charges of poaching against the people of Aliakoro, and secondly, the payment of very large ransoms would be a deterrent. We need seven men for this venture. I call for volunteers."

"Who will head this party?" the Chief asked, looking around. Chituru, one of the elders, said: "Eze Diali, let us not waste time. Olumba is the man for the job. We all know that he has led many exploits like this one." "We still need six men," Eze Diali said. Eager youths came surging forward. Their well-formed muscles rippled as they elbowed one another. It was difficult to choose.' "I suggest Olumba should choose his men. He knows the boys very well and his

judgment should be reliable." It was Wezume, another village elder, who spoke.

- Olumba wore amulets because he _____.
A. was superstitious.
B. was a strong and fearless fighter.
C. wanted to please his wife.
D. wanted to instill fear in Eze Diali.
E. believed in their power of protection
- Olumba looked upwards because _____.
A. he was searching for something in the sky.
B. this was his usual practice.
C. he was short and often had to look up.
D. he lacked height.
E. his wrestling pseudonym was Agadaga
- "Poaching" means
A. stealing
B. cracking eggs
C. fishing
D. deterring thieves
E. demanding ransoms from Aliakoro
- The chief called the meeting because
A. he wanted volunteers to go to Aliakoro
B. he wanted to announce the fact that there would definitely be poachers from Chiolu at the Great Ponds that night
C. he wanted to ask for very large ransoms
D. the elders had devised a plan to prevent the poaching
E. seven men were needed to bring seven
- Why was Olumba chosen?
A. in order not to waste time
B. because his nickname conveyed an impression of strength
C. his amulets for luck were stronger
D. he had caught thieves alive before
E. the passage doesn't say

In each of questions 6-8 choose the word(s) that best complete the meaning in the sentence/

- We watched the woman as she stood up and _____ herself more comfortably.
A. reseated
B. resat
C. reseat
D. resifted

7. The students _____ the principal's appeal for and took to the streets.

- A. deferred
- B. differed
- C. defied
- D. defined

8. The noise from the record seller's workshop _____ on for fishing. my ears.

- A. jeers
- B. jars
- C. jams
- D. jabs

In question 9-11, choose the option opposite in meaning to the word(s) in italics.

9. The Military Governor *upheld* the decision of his cabinet.

- A. Held up
- B. Undercut
- C. Maintained
- D. Abolished
- E. Reversed

10. Chidi is naturally *taciturn*.

- A. Friendly
- B. Cheerful
- C. Dumb
- D. Lively
- E. Reserved

11. James is a disco-addict. He takes his student rather *lightly*.

- A. Humorously
- B. Gloomily
- C. Tediously
- D. Carefully
- E. Seriously

In questions 12-14 choose the words or which best fill(s) the gap(s).

12. There's _____ ventilation in this room; that's you don't breathe well.

- A. few
- B. little
- C. a few
- D. a little

13. Whenever he puts the light on, someone _____ to disturb him.

- A. came
- B. has come
- C. comes
- D. would come

14. It _____ be taken tier repair after all: it's working again.

- A. couldn't
- B. shouldn't
- C. mightn't
- D. needn't

In question 15 choose the word that has the same consonant sound as the one represented by the letter(s) underlined.

15. Chassis

- A. Chip
- B. Cheat
- C. Sharp
- D. Character

ANSWERS FOR ENGLISH 2007/2008

1. E 2. B 3. A 4. A 5. D 6. A 7. C 8. B 9. E
10. A 11. E 12. B 13. B 14. D 15. C

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MATHEMATICS 2007/2008 QUESTIONS

1. Express $8 \times 10^{-4} \div 2 \times 10^{-5}$ as a fraction.

- A. $1/4$
 B. $3/2$
 C. $2/5$
 D. $1/5$

2. Find the values of x for which

$$22^{x-3} - 33 \times 2^x + 4 = 0$$

- A. $x = 2, x = -3$
 B. $x = -2, x = 3$
 C. $x = 4, x = 1/8$
 D. $x=2, x=3$

3. If $260_9 \div 100_2 = 66_n$, find n .

- A. 7
 B. 9
 C. 10
 D. 8

4. Find the values of x such that

$$\begin{pmatrix} 2 & 7 \\ 3 & 1/2 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 10 \\ 7 \end{pmatrix}$$

- A. $x = y = 2$
 B. $x = -2, y = 2$
 C. $x = -2, y = 2$
 D. $x = y = -2$

5. A chord of a circle of radius 13cm is drawn 5cm from the centre of the circle. Find the length of the chord.

- A. 12cm
 B. 24cm
 C. 18cm
 D. $\sqrt{194}$ cm

6. If $x - 2$ is a factor of $px^3 + 2x^2 - 2p + 12$, find the value of p .

- A. $8/5$
 B. $-10/3$
 C. 2
 D. -2

7. In a regular pentagon ABCDE, AC intersects BD at P. Calculate $\angle CPD$.

- A. 108°
 B. 36°
 C. 72°
 D. 48°

8.

Subject	Biolog	Chemistr	Math	Physic
s	y	y	s	s
Marks	95	$2x+10$	X	75

The table above shows the marks obtained by a student in an examination. If the total mark obtained is 300, what is the angle corresponding to the mark obtained in Chemistry if the information is represented in a pie chart?

- A. 120°
 B. 144°
 C. 48°
 D. 108°

9. A ladder 17m rests against a vertical wall so that its foot is 8.5m from the wall. Find the angle of inclination of the ladder to the horizontal floor

- A. 30°
 B. 60°
 C. 45°
 D. 55°

10 Evaluate $\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x - 2}$

- A. 0
 B. 5
 C. ∞
 D. 1

11. If $\frac{dy}{dx} = 6x + 3$ and $y(-1) = 8$, find $y(x)$.

- A. $3x^2 - 3x - 8$
 B. $3x^2 - 3x + 8$
 C. $3x^2 - 3x - 2$
 D. $3x^2 - 3x + 2$

12. The minimum of the function

$$f(x) = 2x^2 - 12x + 5$$
 is

- A. 59
 B. -59
 C. 3
 D. -3

13. A basket contains 5 MTN cards, 6 GLO cards, 3 MTEL cards and 6 Vmobile cards. What is the probability that a card selected from the basket at random will be MTN or MTEL card?

- A. $3/20$
 B. $3/4$
 C. $1/4$
 D. $2/5$

14. Find the range of the numbers $1/3, 1/2, 3/5, 4/5, 2/3, 6/7, 8/9$.

- A. $7/27$

- B. $\frac{13}{45}$
- C. $\frac{9}{5}$
- D. $\frac{5}{9}$

15. If the mean of numbers 4, 3, 5, x, 7 is 5, find the variance.

- A. 2
- B. 10
- C. $\sqrt{2}$
- D. 5

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ANSWERS TO MATHEMATICS 2007/2008

1. A 2. A 3. D 4. D 5. B 6. B 7. C 8. D 9. B
10. B 11. D 12. C 13. D 14. D 15. A

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PHYSICS 2007/2008 QUESTIONS

1. The extension of a spring when 5 g weight was hung from it was 0.56cm. If Hooke's law is obeyed, what is the extension caused by a load 20g weight?

- A. 1.12 cm
- B. 2.14 cm
- C. 2.52cm
- D. 2.2401

2. The distance travelled by a particle starting from rest is plotted against the square of the time-elapsed from the commencement of motion. The resulting graph is a measure of

- A. initial displacement.
- B. initial velocity
- C. acceleration
- D. average velocity

3. A 90cm uniform lever has a load of 30N suspended at 15cm from one of its ends. If the fulcrum is at the centre of gravity. the force that must be applied at its other end to keep it in horizontal equilibrium is

- A. 15N
- B. 20N
- C. 30N
- D. 60N

4. Two points on a velocity-time graph have coordinates (5s, 10m/s) and (20s, 20m/s). Calculate the mean acceleration between the two points.

- A. 0.67m/s²
- B. 0.80 m/s²
- C. 1.50 m/s²
- D. 2.00 m/s²

5. Which of the following statements are correct?

- i. Land and sea-breezes are natural convection
 - ii: The vacuum in a thermos flask prevents heat loss due to convection only
 - iii. Convection may occur in liquids or gases but in solids
- A. i and ii only
 - B. ii and iii only
 - C. i and iii only
 - D. i, ii and iii only

6. The property of the eye known as its power of accommodation is controlled by the

- A. pupil
- B. vitreous humour

C. iris

D. ciliary muscles

7. Under constant tension and constant mass per unit length, the note produced by a plucked string is 500Hz when the length of the wire is 0.9m. At what length is the frequency 150Hz?

- A. 3m
- B. 0.27m
- C. 8.33m
- D. 6740m

8. An object is placed in front of two plain mirrors inclined at an angle of θ° . If the total number of images formed is 7, find the value of θ°

- A. 30°
- B. 45°
- C. 517
- D. 90°

9. The north pole of a magnet can never be separated from the south pole because of a property known as _____.

- A. magnetic dipole.
- B. magnetic moment
- C. magnetic monopole
- D. magnetic quadrupole

10. If the distance between two point charges is increased by a factor of four, the magnitude of electrostatic force between them will be

- A. $\frac{1}{2}$ of its initial value
- B. $\frac{1}{4}$ its initial value
- C. $\frac{1}{16}$ of its initial value
- D. 4 times of its initial value

11. The terminal voltage of a battery is 4.0V when supplying a current of 2.0A; and 2.0V when supplying a current of 3.0A. The internal resistance of the battery is

- A. 0.5 Ω
- B. 1.0 Ω
- C. 2.0 Ω
- D. 4.00

12. The primary aim in high tension transmission is to

- A. Minimize electrical energy losses due to heat production
- B. Increase the rate of energy transfers by using high voltage
- C. Increase the current in the wires

D. Generate electricity at high current and low voltage

13. Which of the following is required to convert a milliammeter to ammeter?

- A. A high resistance in Parallel
- B. A low resistance in series
- C. A low resistance in parallel
- D. A high resistance in series

14. A light of energy 5eV falls on a metal and electrons with a maximum kinetic energy of 2eV are ejected. The work function of the metal is

- A. 0.4eV
- B. 2.5eV
- C. 3.0eV
- D. 7.0eV

15. One of the features of fission process is that

- A. its products are not radioactive
- B. it leads to chain reaction
- C. neutrons are not released
- D. the sum of the masses of the reactants equals the sum of the masses of the products

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ANSWERS TO PHYSICS 2007/2008

1. D 2. C 3. B 4. C 5. C 6. D 7. A 8. B 9. A
10. C 11. C 12. A 13. C 14. C 15. B

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CHEMISTRY 2007/2008 QUESTIONS

- Two immiscible liquids with different boiling points can be separated by
 - the use of separating funnel
 - evaporation
 - distillation
 - decantation
- A mixture of CaCl_2 and CaCO_3 in water can be separated by
 - evaporation
 - sublimation
 - distillation
 - decantation
- Consider the reaction represented by $x\text{Pb}(\text{NO})_2 \rightarrow 2\text{PbO} + y\text{NO}_2 + z\text{O}_2$ What are the values of x, y and z respectively?
 - 2, 6, 3
 - 1, 4, 2
 - 2, 4, 1
 - 2, 4, 2
- 20 cm^3 of H_2 mixed and separated with 100 cm^3 of air containing 21% O_2 . Calculate the volume of the residual gases at 110°C .
 - 31 cm^3
 - 11 cm^3
 - 90 cm^3
 - 110 cm^3
- What is responsible for metallic bonding?
 - Sharing of electrons between the metal atoms
 - Attraction between the atomic nuclei and the cloud of electrons
 - Transfer of electrons from one atom to another
 - Attraction between positive and negative ions
- 25 cm^3 of 1.5 M solution of NaCl are added to 50 cm^3 of 3 M NaCl. The molar concentration of the resulting solution is
 - 2.5 M
 - 3 M
 - 2.25 M
 - 4.5 M
- A solution of salt formed from HCl and NH_3 solutions is
 - acidic
 - basic
 - complex
 - neutral
- Which of the following elements will burn in excess oxygen to form a product that is neutral to litmus?
 - Carbon
 - Hydrogen
 - Sulphur
 - Sodium
- A current was passed for 10 mins and 0.2 mole of Cu was deposited. How many grams of Ag will it deposit? (Cu = 64, Ag = 108)
 - 43.2g
 - 21.6g
 - 10.8 g
 - 5.4 g
- Pollution of underground water by metal ions is very likely in a soil that has high
 - acidity
 - alkalinity
 - chloride content
 - nitrate content
- Producer gas is a gas with low calorific value because it contains more
 - CO_2 than O_2
 - N_2 than CO
 - CO_2 than N_2
 - N_2 than CO_2
- For most reversible reactions,
 - the reaction rate increase with time
 - the reaction rate decreases with time
 - the rate stabilizes with time
 - the rate produces a curve with time
- Which of the following compounds will leave a metal residue when heated?
 - $\text{Cu}(\text{NO}_3)_2$
 - AgNO_3
 - K_2CO_3
 - Na_2CO_3
- Which of the polymers contains nitrogen?
 - Nylon
 - PVC
 - Polyethene
 - Cellulose
- A red precipitate of copper(I)dicarbide is formed when ammonium solution of copper(I) chloride is introduced into
 - $\text{CH}_2=\text{CH}-\text{CH}_2-\text{CH}_3$
 - $\text{CH}_3-\text{CH}_2-\text{C}\equiv\text{CH}$
 - $\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}_3$

D. $\text{CH}_3\text{-C}\equiv\text{C-CH}_3$

ANSWERS TO CHEMISTRY 2007/2008

1. A 2. D 3. C 4. D 5. B 6. A 7. A 8. B 9. A

10. D 11. B 12. C 13. B 14. A 15. D

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USE OF ENGLISH 2008/2009 QUESTIONS

COMPREHENSION

INSTRUCTION: Read the passage carefully and answer the questions that follow it.

Mathematics is the language in which the Book of Nature is written: Mathematics is the queen of the sciences. It is universally agreed that Mathematics is the backbone of Science and Technology. For without mathematics, the engineer is but an artist or a sculptor. He can build his bridge, attest to its form and beauty, but without mathematics he cannot guarantee its reliability to serve the purpose for which it is built. Mathematics is indeed the science of sciences. It is also art of all arts. It is right, legitimate and defensible to consider mathematics as an Art. The poet, the musician, the artist and the mathematician have a lot in common. Fundamental to all their studies and works is their common interest in the logical study of related concepts and objects to form patterns which will produce beauty, harmony and order. Thus, the poet arranges words to produce a pattern called music; the artist arranges colours to produce a pattern called painting and the mathematician arranges abstract ideas into a pattern using symbols, to produce equations. Each of these patterns - the poem, the music, the painting and the equation must stand up to the test of the same order, harmony and beauty. So, if Mathematics is not an art, what is art?

- The views expressed in this passage belong to
 - JAMB
 - artists
 - mathematicians.
 - the poet
 - the author of the passage
- The expression "Mathematics is the queen of sciences- contains
 - a contradiction
 - an analogy
 - an irony.
 - a lie
 - nonsense
- "Mathematics" is written with a capital M in this passage because
 - the writer a mathematician,

- the writer does not know to use punctuation correctly
- the writer wants to distinguish between concept and a subject.
- it is the normal way of writing about the sciences.
- the writer is confused.

4. The last sentence in the passage, "So if Mathematics is not an art, what is art?" is a _____.

- question for the reader to answer.
- statement put in form of a question.
- question combined with a statement.
- mathematical question stated in words.
- pattern which illustrates beauty, harmony and order in language.

5. "Mathematics" can be considered as a form of art because _____

- its main principles is made use of by the arts.
- it involves drawing in figures.
- it is a form of Fine Arts. .! -
- it is a type of Graphic Arts
- it also involves a study of beauty, harmony and order

In questions 6 and 7 Choose the Word that has been correctly spelt

6. It is not easy to _____ jobs sweeping in the streets and on campus.

- maneuver
- manouever
- maneuvor
- maneuver

7. The defendant claimed he had been _____ into making a statement

- coarced
- coaxed
- coarsed
- coerced

In questions 8-10 choose the option that best completes the gap

8. I have reminded him that he is the only _____ can solve my problem.

- who
- which
- that
- whom

9. My sister has _____ several food packages for my birthday party.

- A. laid on
- B. layed up
- C. laid off
- D. layed on

10. Many students were _____ into rioting by the more radical ones

- a. guided
- B. gathered
- C. guarded
- D. goaded

In question 11 choose the option that explains the information conveyed in the sentence.

11. Posters have been printed, and would be distributed to the rank and file.

- A. to both the ordinary members and the leaders.
- B. to those of high ranks and file.
- C. to the leaders alone.
- D. to the ordinary members alone.

In questions 12 and 13, choose the option nearest in meaning to the word(s) in italics

12. Because more reliable evidence is needed to prosecute the case, it is now in *abeyance*.

- A. court record
- B. suspension
- C. privacy
- D. secret

13. In the olden days. mothers of twins were never accepted as members of the society.

They were simply _____.

- A. banished
- B. excommunicated
- C. expelled
- D. ostracized

In question 14, choose the option that has the same vowel sound as the one represented by the letter(s) underlined

14. Flood

- A. Stop
- B. flock
- C. blood

In question 15 choose the option that has the same consonant sound as the one represented by the letter(s) underlined

15. Echelon

- A. Church
- B. Character
- C. Chief
- D. Chassis

ANSWERS TO ENGLISH 2008/2009 P/UTME

1. E 2. B 3. C 4. B 5. E 6. A 7. D 8. C 9. A

10. D 11. D 12. B 13. D 14. C 15. D

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MATHEMATICS 2008/2009 QUESTIONS

1. The average of three numbers is 32_4 . If the sum of two of the numbers is 131_4 , find the third number in base 6.

- A. 43_6
- B. 34_6
- C. 23_6
- D. 32_6

2. Three times the second term plus the seventh term of an AP is equal to the twelfth term. Find the relationship between the first term a and the common difference d .

- A. $3a - 2d = 0$
- R. $3a + 2d = 0$
- C. $3a + d = 0$
- D. $3a - d = 0$

3. A fence of 36m is to be built to make three sides of a rectangular compound, the fourth side being a building. Find the possible lengths of the shorter sides of the compound if the area enclosed 160m^2 .

- A. 20m, 10m
- B. 16m, 8m
- C. 20m, 16m
- D. 10m, 8m

4. Find $\frac{dy}{dx}$ if $y = 2x^2 - \sin 2x$

- A. $4x + 2\cos x$
- B. $4x - 2\cos 2x$
- C. $4x + 2\cos 2x$
- D. $4x - 2\cos x$

5. A bag contains $4x$ First bank ATM cards, $(2x-1)$ UBA bank ATM cards and $3(x+1)$ Zenith Bank ATM cards. If the probability of picking a First Bank ATM is $\frac{2}{5}$; how many UBA Bank ATM cards are in the bag?

- A. 3
- B. 8
- C. 9
- D. 20

6. Express the product of 0.000128 and 0.00125 in standard form.

- A. 1.6×10^{-11}
- B. 1.6×10^{-5}
- C. 1.6×10^{-7}
- D. 1.6×10^{-4}

7. Make x the subject of the relation $y = 3 - \ln x$

- A. e^{3-y}
- B. e^{y-3}
- C. $\frac{y}{3}$

D. $\frac{3}{y}$

8. In the diagram below, O is the centre of the circle of radius 42cm. Find the area of the shaded Portion (Take $\pi = \frac{22}{7}$).



- A. 903 cm^2
- B. 441 cm^2
- C. 462 cm^2
- D. 21 cm^2

9. A student dropped an object from a building 100m high. If the height of the object above the ground after t seconds is $100 + 4.9t^2$ m. how fast is it falling 3 seconds after it is dropped?

- A. 14.7m/sec
- B. 85.3m/sec
- C. 29.4m/sec
- D. 70.6m/sec

10. An investor who invested ₦6,500.00 at some simple interest rate collected a will amount of ₦7,800.00 after four years. How much simple interest would he have collected after two years if he had invested ₦9,000.00?

- A. ₦1,000.00
- B. ₦10,000.00
- C. ₦5 400.00
- D. ₦900.00

11. Differentiate $(\cos\theta + \sin\theta)^2$ with respect to θ .

- A. $2\cos\theta$
- B. $2\sin 2\theta$
- C. $-2\cos 2\theta$
- D. $-2\sin 2\theta$

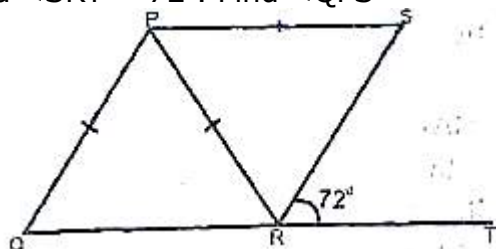
12. If the sum of the roots of the equation $2x^2 - 5px + 8 = 0$ is five times the product of the roots, find the value of p .

- A. -8
- B. $\frac{1}{8}$
- C. 8
- D. $-\frac{1}{8}$

13. Find the area of region enclosed by the curve $y = 2 - x^2$ and the line $y = -x$.

- A. $\frac{3}{2}$
- B. 9
- C. 3
- D. $-\frac{9}{2}$

14. In the figure below, $\angle PQ/ = \angle PR/ = \angle PS/$ and $\angle SRT = 72^\circ$. Find $\angle QPS$



- A. 72°
- B. 108°
- C. 144°
- D. 54°

15. If $x-1$ is a factor of $3x^3 - px^2 + 5x - 3p$, find the value of p

- A. -2
- B. 2
- C. $\frac{1}{2}$
- D. $-\frac{1}{2}$

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ANSWERS TO MATHEMATICS 2008/2009

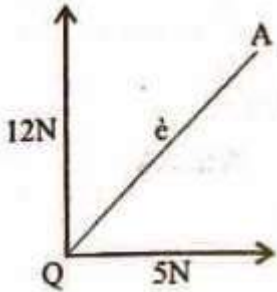
1. B 2. A 3. D 4. B 5. A 6. C 7. A 8. D 9. C
10. D 11. A 12. C 13. D 14. C 15. B

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PHYSICS 2008/2009 QUESTIONS

1. A body of mass 5kg initially at rest is acted upon by two mutually perpendicular forces 12N and 5N as shown in the figure below. If the particle moves in the direction QA, calculate the magnitude of the acceleration.



- A. 2.60m/s^2
- B. 0.26m/s^2
- C. 3.40 m/s^2
- D. 1.40 m/s^2

2. A car of mass 1500kg goes round a circular curve of radius 50m at a speed of 40m/s. The magnitude of centripetal force on the car is

- A. $1.2 \times 10^2\text{N}$
- B. $1.2 \times 10^3\text{N}$
- C. $4.8 \times 10^3\text{N}$
- D. $4.8 \times 10^4\text{N}$

3. The efficiency of a machine is always less than 100% because

- A. load lifted is always greater than work input
- B. load lifted is always greater than the applied effort
- C. effort applied is always greater than mechanical advantage
- D. velocity ratio is always greater than the mechanical advantage

4. Which of these statements is not true? Thermostats are used to control the temperature of

- A. pressure cookers
- B. laundry irons
- C. hot water storage tanks
- D. aquaria for tropical fish

5. A given mass of an ideal gas occupies a volume V at a temperature T and under a pressure P. If the pressure is increased to 2P and the temperature reduced to $\frac{1}{2}T$, then

the percentage change in volume of the gas is

- A. 25%
- B. 75%
- C. 300%
- D. 1%

6. The thermometric property of a constant volume of thermometer is

- A. change in pressure
- B. change in length
- C. differential expansion
- D. change in volume

7. The combination of sound waves with different frequencies is known as

- A. interference
- B. diffraction
- C. superposition
- D. resonance

8. Which of the following characteristics of a wave is used in the measurement of the depth of the sea?

- A. Refraction
- B. Reflection
- C. Diffraction
- D. Interference

9. Which of the following eye defects can be corrected using a cylindrical lens?

- A. Astigmatism
- B. Presbyopia
- C. Chromatic aberration
- D. Myopia

10. The resistance of a wire depends on

- A. the length of the wire
- B. the area of the wire
- C. the temperature of the wire
- D. all of the above

11. A dynamo primarily converts

- A. mechanical energy into electrical energy
- B. electrical energy into kinetic energy
- C. potential energy into kinetic energy
- D. kinetic energy into potential energy

12. If a current carrying coil is mounted on a metal frame, the back emf induced in the coil causes

- A. inductance
- B. eddy current
- C. electromagnetism

D. dipole moment

13. Which of the following may be found in light nuclei?

- i. β - particles
 - ii. protons
 - iii. neutrons
 - iv. α -particles
- A. i and ii only
B. i and iii only
C. i and iv only
D. ii and iii only

14. The difference between X-rays and γ -rays is that

- A. X-rays arise from energy changes and are due to electrons while γ -rays come from the nucleus
B. X-rays are electromagnetic radiations while γ -rays are not
C. X-rays have higher frequencies than γ -rays
D. X-rays are more penetrating than γ -rays

15. When an atom loses or gains a charge, it becomes

- A. an electron
B. an ion
C. a neutron
D. a proton

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ANSWERS TO PHYSICS 2008/2009

1. A 2. D 3. D 4. C 5. A 6. A 7. C 8. B 9. A
10. D 11. A 12. B 13. D 14. A 15. B

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CHEMISTRY 2008/2009 QUESTIONS

1. What are the values of p, q, r and s respectively in the equation? '
 $p\text{CH}_4 + q\text{O}_2 \rightarrow r\text{CO} + s\text{H}_2\text{O}$
 A. 1, 2, 1, 2
 B. 1, 3, 2, 2
 C. 2, 3, 2, 4
 D. 2, 3, 2, 2
2. KHCO_3 is contaminated with K_2CO_3 as impurity. If 2.5 g of the impure KHCO_3 on heating produces 0.224 dm^3 of CO_2 at s.t.p., calculate the percentage of K_2CO_3 impurity. (K=39, H = 1, C = 12, O = 16)
 A. 30%
 B. 40%
 C. 10%
 D. 20%
3. The partial pressure of N_2 in a container at 50°C in which there are 0.30 mole of N_2 and 1.2 mole of CO_2 at a pressure of 2.00 atm is?
 A. 0.6 atm
 B. 0.5 atm
 C. 0.4 atm
 D. 1.6 atm
4. The major reason why chemical reaction occurs among elements is that they have the tendency to
 A. attain the nearest noble gas structure
 B. become a metal
 C. become a non-metal
 D. become a noble element
5. Given that the pH of a solution of KOH is 12, what is the concentration of the OH^- ions?
 A. 0.01 mol/dm^3
 B. $1 \times 10^{-12} \text{ mol/dm}^3$
 C. $1 \times 10^{-14} \text{ mol/dm}^3$
 D. $1 \times 10^{-7} \text{ mol/dm}^3$
6. Which of the following salt has a pH less than 7?
 A. NaHCO_3
 B. NH_4Cl
 C. Na_2SO_4
 D. NaCl
7. In which of the following reactions. does hydrogen peroxide act as a reducing agent?
 A. $\text{PbO}_2 + 2\text{HNO}_3 + \text{H}_2\text{O}_2 \rightarrow \text{Pb}(\text{NO}_2)_3 + 2\text{H}_2\text{O} + \text{O}_2$
 B. $\text{H}_2\text{S} + \text{H}_2\text{O}_2 \rightarrow \text{S} + 2\text{H}_2\text{O}$
 C. $\text{PbSO}_2 + \text{H}_2\text{O}_2 \rightarrow \text{PbSO}_4 + \text{H}_2\text{O}$

- D. $2\text{I} + 2\text{H} + \text{H}_2\text{O}_2 \rightarrow \text{I}_2 + 2\text{H}_2\text{O}$
8. Temporary hardness of water is removed by the use of the following EXCEPT
 A. Boiling
 B. Use $\text{Ca}(\text{OH})_2$
 C. Use of Na_2CO_3
 D. Use of alum
9. Hydration of ions in solution is associated with
 A. Liberation of heat
 B. Absorption of heat
 C. Reduction of heat
 D. Conduction of heat
10. A piece of radioactive element has initially 8.0×10^{27} atoms. Half-life is two days. After 16 days the number of atoms is
 A. 5×10^{21}
 B. 5×10^{22}
 C. 2×10^{22}
 D. 2×10^{21}
11. Which of the following pairs of substances are hygroscopic?
 A. CaCl_2 and NaOH
 B. CaO and KOH
 C. Conc. H_2SO_4 and MgCl_2
 D. CuO and CaO
12. Zinc is not regarded as a transition metal even though it is a d-block element because
 A. It has no electron in 3d-orbitals
 B. It has all 3d-orbitals completely filled
 C. It blends with other neighbouring elements
 D. It does not form complex ions like others
13. Silver chloride turns grey when exposed to sunlight because
 A. The silver ion is reduced to silver
 B. The silver ion is oxidized to silver
 C. Silver is a transition metal
 D. The silver chloride forms complexes in the sun
14. Which of these compounds exhibits resonance?
 A. Benzene
 B. Ethanol
 C. Propene
 D. Butyne

15. Hydrolysis of $\text{CH}_3\text{COOCH}_2\text{CH}_3$ in dilute HCl produces

- A. $\text{CH}_3\text{COOH} + \text{CH}_3\text{CH}_3$
- B. $\text{CH}_3\text{CH}_2\text{OH} + \text{CH}_3\text{COCl}$
- C. $\text{CH}_3\text{COOH}; + \text{CH}_3\text{CH}_2\text{OH}$
- D. $\text{CH}_3\text{COOH} + \text{CH}_3\text{CH}_3$

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ANSWERS TO CHEMISTRY 2008/2009

1. A 2. D 3. B 4. A 5. A 6. A 7. A 8. D 9. A

10. – 11. D 12. B 13. D 14. A 15. C

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USE OF ENGLISH 2009/2010 QUESTIONS

COMPREHENSION

INSTRUCTION: Read the passage below carefully and answer the questions 1-5 that follow.

All over the world till lately, and in most of the world till today mankind has been following the course of nature: that is to say, it has been breeding up to maximum. To let nature, take her extravagant course in the reproduction of the human race may have made sense in an age in which we were also letting her take her course in decimating mankind by the casualties of war, pestilence, and famine. Being human, we have at least revolted against that senseless waste. We have started to impose on nature's heartless play a humane new order of our own.

But, once man has begun to interfere with nature, he cannot afford to stop half way. We cannot, with impunity, cut down the death-rate and at the same time allow the birth-rate to go on taking nature's course. We must consciously try to establish an equilibrium or, sooner or later, famine will stalk aboard again.

1. The author observes that
 A. war, pestilence and famine were caused by the extravagance of nature.
 B. nature was heartless and senseless.
 C. there was a time when uncontrolled birth made sense.
 D. it was wise at a time when mankind did not interfere with normal reproduction.
 E. nature was heartless in its reproductive process.

2. Which of these statements does not express the opinion of the author?
 A. mankind has started to interfere with the work of nature.
 B. many people had died in the past through want and disease.
 C. mankind should have the maximum number of children possible
 D. mankind should take care of its children
 E. man's present relationship with nature in matters of birth and death is a happy one.

3. "Humane" as used in the passage means
 A. sensible

B. wise
 C. human
 D. benevolent
 E. thorough

4. "We must consciously try to establish equilibrium" in the passage implies that mankind must
 A. realistically find an equation.
 B. strive not to be wasteful.
 C. purposely try to fight nature.
 D. try to fight nature;
 E. deliberately find a balance.

5. The main idea of this passage is that
 A. nature is heartless.
 B. man should control the birth rate
 C. mankind will soon perish of Starvation.
 D. pestilence causes more deaths than war.
 E. man should change nature's course gradually

In questions 6 and 7, select the option that best explains the information conveyed in the sentence

6. With the screening test around the corner, *I've got the jitters already.*
 A. I've felt confident.
 B. I've felt secured and hopeful.
 C. I'm getting anxious.
 D. I'm getting afraid

7. The teacher warned her students against resting on them
 A. relaxing on soft chairs
 B. taking things for granted
 C. depending on past achievements
 D. feeling satisfied and making no new efforts

In questions 8-11, choose the word(s) that best completes the meaning in the sentences

8. The door handle was shaky because the screws had _____
 A. lost
 B. loosed
 C. losed
 D. loosened

9. Something is being done to detect the person who _____ the crime.

- A. perpetrated
- B. perpetuated
- C. performed
- D. promoted .

10. The lawyer pleaded with the judge to _____ justice with mercy.

- A. temper
- B. temper
- C. tamper
- D. taper

11. Obi bought five novels last week and has gone through all. He is totally a _____ reader.

- A. vicarious
- B. voracious
- C. vivacious
- D. veracious

In questions 12 and 13, choose the option nearest in meaning to the word(s) or phrase(s) in italics

12. He lost his voice *momentarily*.

- A. in a moment
- B. in a split moment .
- C. for a brief period of time
- D. without delay
- E. instantly

13. In some parts of India, people are *ostracized* simply because of their ancestry.

- A. abandoned
- B. shut off from society
- C. refused education
- D. rendered unhappy
- E. hated

In questions 14-15 choose the word(s) or phrase which best fills the gap(s)

14. _____ him in the crowd, I would have told you at once.

- A. Had it been I saw
- B. if I saw
- C. Had I seen
- D. Should I see

15. _____ he had insufficient qualification; he was denied admission.

- A. Hence
- B. For the fact
- C. Being
- D. As

USE OF ENGLISH 2009/2010 ANSWERS

1. C 2. E 3. A 4. E 5. B 6. C 7. D 8. D 9. A
10. B 11. B 12. C 13. B 14. C 15. D

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MATHEMATICS 2009/2010 QUESTIONS

1. In a school, 180 students offer Mathematics or Physics or both. If 125 offer Mathematics and 105 offer Physics, how many students offer Mathematics only?
- A. 75
B. 80
C. 55
D. 125
2. Find the value of x for which $3(2^{4x+3}) = 96$
- A. 2
B. -2
C. $\frac{1}{2}$
D. $-\frac{1}{2}$
3. The cost of renovating a 5m square room is ₦500. What is the cost of renovating a 10m square room?
- A. ₦1, 000
B. ₦2, 500
C. ₦2, 000
D. ₦10, 000
4. Find the rate of change of the total surface area S of a sphere with respect to its radius r when $r = 2$.
- A. 8π
B. $.16\pi$
C. 10π
D. 14π
5. Evaluate $\int_0^{\pi} \frac{\sin^2\theta - 1}{\cos^2\theta} d\theta$
- A. π
B. $-\pi$
C. $\pi + c$
D. $\frac{\pi}{2}$
6. Differentiate $(\cos\theta + \sin\theta)^2$ with respect to θ .
- A. $2\cos 2\theta$
B. $2\sin 2\theta$
C. $-2\cos 2\theta$
D. $-2\sin 2\theta$
7. A binary operation $*$ on the set of rational numbers is defined as $x * y = 2x \frac{x^3 - y^3}{x + y}$, find $-1 * 2$
- A. 11
B. -11
C. 8
D. -8
8. A polynomial in x whose zeroes are 2, 1 and -3 is
- A. $x^3 - 7x + 6 = 0$
B. $x^3 + 7x - 6 = 0$
C. $x^3 - 7x - 6 = 0$
D. $x^3 + 7x + 6 = 0$
9. Find the range of values of x for which $7x - 3 > 3x + 4$.
- A. $x < \frac{7}{4}$
B. $x > \frac{7}{4}$
C. $7 < x < 4$
D. $-4 < x < 7$
10. Let P be a probability function on set S , where $S = \{C_1, C_2, C_3, C_4\}$. Find $P(C_3)$ if $P(C_1) = \frac{3}{10}$ and $P(C_4) = \frac{1}{4}$
- A. $\frac{2}{5}$
B. $\frac{1}{2}$
C. $\frac{1}{6}$
D. $\frac{1}{3}$
11. Calculate the standard deviation of the following data 7, 8, 9, 10, 11, 12, 13.
- A. 2
B. 4
C. 10
D. 11
12. If w is the mode and z is the median of the following set of numbers: 2.4, 2.1, 1.6, 2.6, 2.6, 3.7, 2.1 and 2.6, then $(3w, 2z)$ is
- A. (2.6, 2.5)
B. (2.1, 2.5)
C. (7.8, 5.0)
D. (6.2, 5.0)
13. A trapezium has two parallel sides of length 6cm and 8cm. If the area is 42cm^2 , find the distance between the parallel sides.
- A. 6 cm
B. 7cm
C. 8cm
D. 5cm
14. An arc of a circle of length 22cm subtends an angle of $3y^\circ$ at the centre of the circle. Find the value of y , if the radius of the circle is 7cm.
- A. 30°
B. 60°
C. 120°
D. 150°

15. Find the locus of a point which moves such that its distance from the line $y = 3$ is a constant k .

- A. $y = 3 + k$
- B. $y = 3 - k$
- C. $y = 3 + k$
- D. $y = k - 3$

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ANSWERS TO MATHEMATICS 2009/2010

1. A 2. C 3. C 4. B 5. B 6. A 7. B 8. A 9. B

10. C 11. A 12. C 13. A 14. B 15. C

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PHYSICS 2009/2010 QUESTIONS

1. A body falls freely under gravity ($g = 9.8 \text{ m/s}^2$) from a height of 10 m on top of a platform 0.8 m above the ground. Its velocity on reaching the platform is

- A. 7848 m/s
- B. 80 m/s
- C. 78 m/s
- D. 27.78 m/s

2. A hydrometer is an instrument used for measuring the

- A. depth of water in a vessel
- B. relative density of a liquid by method of flotation
- C. relative density of a liquid by finding the apparent loss in weight
- D. relative humidity of the atmosphere

3. A bead traveling on a straight wire is brought to rest at 0.2 m by friction. If the mass of the bead is 0.01 kg and the coefficient of friction between the bead and the wire is 0.1, determine the work done by friction.

- A. $2 \times 10^{-4} \text{ J}$
- B. $2 \times 10^3 \text{ J}$
- C. $2 \times 10^1 \text{ J}$
- D. $2 \times 10^2 \text{ J}$

4. A machine whose efficiency is 60% has a velocity ratio of 5. If a force of 500N is applied to lift a load of P(N), what is the magnitude of P?

- A. 750N
- B. 4166N
- C. 500N
- D. 1500N

5. A mass of gas at 7°C and 70cm of mercury has a volume of 1200 cm^3 . Determine its volume at 27°C and a pressure at 75cm of mercury.

- A. 1200 cm^3
- B. 1378 cm^3
- C. 4320 cm^3
- D. 4629 cm^3

6. A motor tyre is inflated to a pressure of $2.0 \times 10^5 \text{ Nm}^{-2}$ when the temperature of air is 27°C . What will be the pressure at 87°C assuming the volume does not change?

- A. $2.6 \times 10^{-5} \text{ Nm}^{-2}$
- B. $2.4 \times 10^{-5} \text{ Nm}^{-2}$
- C. $2.2 \times 10^{-5} \text{ Nm}^{-2}$
- D. $1.3 \times 10^{-5} \text{ Nm}^{-2}$

7. A beam of light is incident from air to water at an angle of 30° . Find the angle of refraction if the refractive index of water is $\frac{4}{3}$.

- A. 15°
- B. 18°
- C. 22°
- D. 240°

8. The wavelength of signal from a radio transmitter is 1500m and the frequency is 200KHz. What is the velocity of the propagation?

- A. $3 \times 10^8 \text{ ms}^{-2}$
- B. $7 \times 10^3 \text{ ms}^{-2}$
- C. $3 \times 10^4 \text{ ms}^{-2}$
- D. 7 ms^{-2}

9. A boy on looking into a mirror discovers that his face appeared to have grown bigger. The boy must have been looking at a

- A. convex mirror with his face at the focus
- B. concave mirror with his face between the focus and the mirror
- C. convex mirror with his face between the focus and the mirror
- D. concave mirror with his face at this focus

10. Find the frequencies of the first three harmonics of a piano string of length 1.5m, if the velocity of the string is 120m/s.

- A. 40Hz, 80Hz, 120Hz
- B. 180Hz, 360Hz, 540Hz
- C. 80Hz, 160Hz, 240Hz
- D. 360Hz, 180Hz, 90Hz

11. The resistance of a piece of wire of length 20 cm and cross-sectional area $8 \times 10^{-5} \text{ m}^2$ and resistivity $4 \times 10^{-7} \Omega\text{m}$ is

- A. 1.0 Ω
- B. 10.0 Ω
- C. 400.0 Ω
- D. 1.0×10^{-13}

12. An electric device is rated 2000W, 250 V. The correct fuse rating of the device is

- A. 8A
- B. 9A
- C. 7A
- D. 6A

13. Determine the inductive reactance when a 30.0mH inductor with negligible resistance is connected to a 1.3 KHz oscillator

- A. 39.0 Ω

- B. 122.5Ω
- C. 245.0Ω
- D. $39K\Omega$

14. The half-life of a radioactive element is 9days. Calculate the fraction that remains after 36days.

- A. $\frac{1}{32}$
- B. $\frac{1}{16}$
- C. $\frac{1}{4}$
- D. $\frac{15}{32}$

15. The graphite rods surrounding the uranium fuel rods in a nuclear reactor are used to

- A. absorb the neutrons and hence halt the nuclear process
- B. create the neutrons- and hence slow down the nuclear process
- C. slow down the neutrons and hence slow down the nuclear process
- D. speed up the neutrons and hence speed up the nuclear process

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ANSWERS TO PHYSICS 2009/2010

1. - 2. B 3. B 4. D 5. A 6. B 7. C 8. A 9. B
10. A 11. D 12. A 13. C 14. B 15. C

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CHEMISTRY 2009/2010 QUESTIONS

1. The presence of NaCl in ice will
- lower the boiling point of NaCl
 - increase the melting point of NaCl
 - make NaCl impure
 - lower the melting point of ice
2. What are the values of x, y and z in the equation below?
 $x\text{NH}_3 + y\text{O}_2 \rightarrow z\text{NO} + 6\text{H}_2\text{O}$
- 2, 3, 4
 - 4, 5, 4
 - 6, 5, 4
 - 2, 3, 4
3. Calculate the volume of CO_2 measured at STP produced on heating 250g of potassium hydrogencarbonate strongly. (K = 39, H = 1, C=12, O=16)
- 28 dm³
 - 2.8 dm³
 - 5.6 dm³
 - 11.2 dm³
4. The boiling points of water, ethanol, methylbenzene and butan-2-ol are 373.0K, 351.3K, 383.6K and 372.5K respectively. Which liquid has the highest vapour pressure at 323.0K
- Water
 - Methylbenzene
 - Ethanol
 - Butan-2-ol
5. The conclusion from Rutherford's alpha-scattering experiment is that
- Atoms are mostly empty space with a small nucleus
 - Emissions from radioactive substances consist of three main components
 - There is a nuclear pull on orbital electron.
 - Electrons are deflected by both magnetic and electric fields
6. Elements P, Q and R have atomic numbers 9, 16 and 20 respectively. Which of them would gain electron(s) during ionic bonding?
- Q and R
 - P and R
 - P and Q
 - P, Q and R
7. Which of the following has the lowest pH?
- 5 cm³ of M/10 HCl
 - 10 cm³ of M/10 HCl
 - 20 cm³ of M/8 HCl
 - 15 cm³ of M/2 HCl
8. Which of the following is an acid salt?
- (NH₄)₂CO₃
 - CHCOONa
 - KHSO₄
 - MgSO₄·7H₂O
9. $\text{CrO}_7^{2-} + 14\text{H}^+ + 6\text{I}^- \rightarrow 2\text{Cr}^{3+} + 3\text{I}_2 + 7\text{H}_2\text{O}$
 The change in the oxidation number of oxygen in the equation above is
- 0
 - 1
 - 2
 - 7
10. During the electrolysis of CuSO_4 solution using Platinum electrodes, which of the following occurs?
- Acidity increases at the cathode
 - Oxygen is liberated at the cathode
 - pH decreases at the cathode
 - pH of solution decreases
11. Which of the following ions is a pollutant in drinking water even in trace quantities?
- Ca^{2+}
 - Pb^{2+}
 - Mg^{2+}
 - Fe^{2+}
12. The solubility of a salt of molar mass 100g at 20°C is 0.34mol/dm³. If 3.4g of that salt dissolved completely in 250cm³ of water at that temperature, the resulting solution is
- A suspension
 - Saturated
 - Unsaturated
 - Supersaturated
13. Catalyst is important in chemical industry in that
- It affects the purity of the products
 - It affects the quantity of the products
 - It increases the time for reaching equilibrium
 - Bond breaking is slowed down
14. A mono-carboxylic acid has a molecular mass of 88. Name the acid. (C= 12, O 16, H= 1)
- Propanoic acid
 - Butanoic acid

- C. Pentanoic acid
- D. But-2-ionic acid

15. Ethyne undergoes the following reactions except

- A. Polymerization
- B. Addition
- C. Substitution
- D. Etherification

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ANSWERS TO CHEMISTRY 2009/2010

1. D 2. B 3. A 4. C 5. A 6. C 7. D 8. D 9. A

10. D 11. B 12. C 13. C 14. B 15. D

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USE OF ENGLISH 2010/2011 QUESTIONS [SESSION 1]**COMPREHENSION**

INSTRUCTION: *Read the passage carefully, and answer the questions that follow it.*

Although our aim is to nurture children, Nigerian children are still subjected to severe physical, social and mental stress as they develop. So far, our interest and activities have been to ensure their physical well-being through the reduction of high mortality and morbidity rates, still inadequate as this may be. But we need to examine from time to time the other needs of the Nigerian child which will ensure a totally healthy development.

We are split between two cultures our traditional and the western, a relic of our colonial past. This also affects our child rearing practices. Therefore, these practices must have a very important bearing on how the child is prepared for our world of today so that he fits into our different personalities in terms of motivation, aggressiveness, achievement and the integration of the individual into the community socially and culturally. It is important that, while we struggle with the visible organic diseases, we fix our gaze on the other important measure to attain this one a healthy child.

The process of social adjustment begins from the moment of birth. Many of our traditional birth practices ensure that the mother either carries or suckles her child immediately after birth. The baby therefore comes into close contact with the mother at this critical time. Moreover, she is forced to stay indoors with the baby for varying periods of time. By this means, the attachment of the baby to the mother, so essential for the child's ability to relate to her in future, is secured.

This crucial moment in the baby's life is now being recognized in western countries, whilst birth practices in some hospitals and maternity homes separate mother and child immediately after birth to the extent that their ability to develop a close relationship may be jeopardized. Our Nigerian child of today may, therefore, be worse off than that of yesterday. As we move towards the

training of our traditional birth attendants with a view to incorporating them into our health services, healthy practices such as the one described above must be maintained and encouraged.

1. In the passage there is an attempt to explain that to ensure a totally healthy child
 - A. it is necessary to concentrate on the child's physical well-being alone
 - B. it is essential to reduce the high child mortality and morbidity rate
 - C. it is necessary to take care of other things in addition to the child's physical well-being
 - D. it is important to keep to the rules of hygiene
 - E. it is necessary to copy foreign ways of bringing up children

2. It is said that differences in ways of bringing up children and educating them
 - A. achieve the same results
 - B. are reflected in the personalities, attitudes and achievements of the individual
 - C. make people aggressive
 - D. have nothing to do with educational attainments
 - E. are a matter of the cultural background of the people

3. Since the training for social adjustment begins from the moment of birth, our traditional practices
 - A. are too uncivilized to be helpful
 - B. need to be modernized
 - C. are very helpful to the proper growth of the child
 - D. make the child stranger to modern civilization
 - E. are the cause of under-development

4. In spite of the fact that the western countries now recognize the importance of the early period of childhood in forming a relationship, Nigerian hospitals and maternity homes
 - A. copy the wrong-western practice now being criticized in western countries .
 - B. improve on local practices and the future, of the child is secure
 - C. ensure that the child is brought up in the right way

- D. ensure that the child develops the right skills - for establishing relationships
- E. do not know which practice to choose

5. Unless the training of our traditional birth, attendant is based on healthy practices
- A. our children will be under-developed
 - B. our children will be worse off than those brought up in the traditional way
 - C. our medical services will be unable to provide the right services
 - D. our economic progress will be adversely affected
 - E. the role of the mother will be rendered useless

In the following sentences, choose the word that is SIMILAR IN MEANING to the word italicized/underlined in each of the sentences.

6. We consider the recent silver jubilee celebration in the state a very *historic* event.
- A. important
 - B. memorable
 - C. ancient
 - D. critical

7. The governor's address during his recent visit to our town was delivered *extempore*.
- A. out-of-hand
 - B. timely
 - C. off-hand
 - D. expertly

8. One of the candidates was handed over to the police for attending the interview with *spurious* credentials.
- A. false
 - B. incomplete
 - C. unsigned
 - D. altered

9. There is a theory that *postulates* that all Nigerian languages derive from one source.
- A. confirms
 - B. affirms
 - C. suggests
 - D. emphasizes

10. The candidate was disqualified as a result of his *irreverent* behaviour.
- A. shameful
 - B. disrespectful
 - C. careless
 - D. abnormal

In each of the questions in this section, choose the option that best completes the gap.

11. The rain.....when the accident took place.
- A. has stopped
 - B. stopped
 - C. was stopped
 - D. had stopped

12. Players for the next FIFA world competition have been _____.
- A. choosen
 - B. chosed
 - C. chosen
 - D. choosed

13. The boy was _____ by snake early this morning.
- A. beaten
 - B. bitten
 - C. bit
 - D. bite

14. It is desirable that you _____ there when he arrived.
- A. be
 - B. are
 - C. will be
 - D. should be

15. If I _____ in Udenta's position, I would go into politics.
- A. am
 - B. was
 - C. were
 - D. be

ANSWERS TO USE OF ENGLISH 2010/2011 (Session 1)

1. C 2. B 3. C 4. A 5. B 6. B 7. C 8. A 9. C
10. B 11. D 12. C 13. B 14. B 15. C

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USE OF ENGLISH 2010/2011 QUESTIONS [SESSION 2]**COMPREHENSION**

INSTRUCTION: Read the passage carefully, and answer the questions that follow it.

Our planet is at risk. Our environment is under threat. The air we breathe, the water we drink, the seas we fish in, and soils we farm, the forests, animals and plants which surround us are in danger. New terms and words describe these problems - acid rain, the greenhouse effect, global warming, holes in the ozone layer, desertification and industrial pollution. We are changing our environment. More and more gases and wastes escape from our factories. Rubbish, oil spillages and detergents damage our rivers and seas. Forests give us timber and paper, but their loss results in soil erosion and also endangers wildlife.

The richer countries of the world are mainly responsible for industrial pollution. This is where most of all the commercial energy is produced. In developing countries, poverty cause people to change their environment to overgraze grassland, to cut down trees for new land and firewood, to farm poor soil for food.

The United Nations Environmental Protection Agency says that an area of forest the size of Sierra Leone disappears every year. Trees are cut down for timber which is used for building, furniture, paper and fuel. They are also destroyed to provide land on which to graze animals and build new villages and towns. But trees have many other important uses. Trees protect the land from heavy downpour of rain and their roots help to hold the soil together. Forests are also the home of many living things. The Amazon forest contains one fifth of all the species of birds in the world. In our forests, there may be plants and animals which could help in the discovery of new medicines or crops.

To rescue and conserve our beautiful world, we must act cooperatively. Individuals, communities, nations and international associations, all have a responsibility. By learning to protect the natural environment, we can manage the earth's resources for generations to come.

- The risk referred to in the passage is _____.
A. environmentally induced
B. industrially produced
C. man-made
D. sociologically produced
- From the passage, it can be deduced that the inhabitants of developing countries
A. take more care of their environment than those in developed countries
B. generate more harmful industrial by-products
C. degrade the environment to eke out a livelihood
D. cut down trees only for farmlands and fuel
- According to the passage, the size of forest depleted annually is
A. minimal
B. colossal
C. infinitesimal
D. Infinite
- The writer holds the richer countries responsible for industrial pollution because of their _____.
A. technological innovations
B. energy requirement
C. industrial revolution
D. lack of interest in environmental protection
- The message of the writer is the _____.
A. need for the developed countries to assist the poorer ones
B. grave dangers of global warming
C. urgent need to protect the natural environment
D. need to research into other uses of the trees in our forest

In the following sentences, choose the word that best completes the meaning in each of the sentences.

- The manager failed to control his staff because he was very _____.
A. rash
B. indiscreet
C. reckless
D. tactless
- The usefulness of the fertilizer in modern farming should be widely

- A. diffused
- B. disseminated
- C. spread
- D. scattered

8. He was the only candidate who failed the interview. So, he had to bear his _____.

- A. disaster
- B. misfortune
- C. catastrophe
- D. calamity

9. The death of the night-guard continues to be a _____ to the police.

- A. confusion
- B. puzzle
- C. quagmire
- D. problem

10. A few politicians were _____ from the accusation of wrong doing.

- A. restrained
- B. rescued
- C. absolved
- D. precluded

In the following sentences, choose the word that is OPPOSITE IN MEANING to the word in *italic/underlined* in each of the sentences

11. The officer has commended the *cordial* relationship existing between the soldiers and the civilians.

- A. disordered
- B. confused
- C. strained
- D. unfortunate

12. Many foreign experts would like to establish in this country because the environment is *congenial*.

- A. hostile
- B. inhospitable
- C. aggressive
- D. offensive

13. The new chairman has exhibited *prudence* in his handling of the revenue.

- A. impudence
- B. shabbiness
- C. dishonesty
- D. recklessness

14. There is no point *dissipating* energy on a useless argument.

- A. destroying
- B. marshalling

- C. storing
- D. conserving

15. There is much *apathy* among youths nowadays towards reading novels.

- A. indecision
- B. indifference
- C. enthusiasm
- D. inclination

ANSWERS TO USE OF ENGLISH 2010/2011 (Session 2)

1. C 2. C 3. B 4. B 5. C 6. D 7. B 8. B 9. B

10. C 11. C 12. A 13. D 14. D 15. C

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MATHEMATICS 2010/2011 QUESTIONS

1. Simplify $\sqrt[5]{(243)^{-1}x^5}$

- A. $x/3$
 B. $3/x$
 C. $-x/3$
 D. $-3/x$

2. Without using tables, evaluate

$$(125)^{1/3} \times (0.49)^{1/2} \times (0.01)^{1/2}$$

- A. $7/20$
 B. $20/7$
 C. $5/7$
 D. $7/5$

3. Convert 1231_4 to a number in base 6.

- A. 105_6
 B. 301_6
 C. 103_6
 D. 501_6

4. Find the slope of the curve

$$y = 3x^3 + 5x^2 - 3 \text{ at } (-1, 5).$$

- A. 1
 B. -1
 C. 19
 D. -19

5. Find the area of the region bounded by $y = x^2 - x - 2$ and x-axis.

- A. $9/2$
 B. $-9/2$
 C. $8/3$
 D. $16/3$

6. The minimum value of $y = x^2 - 4x - 5$ is

- A. 2
 B. -2
 C. 13
 D. -13

7. Make x the subject of the relation

$$y = 3 - \ln x.$$

- A. e^{3-y}
 B. e^{y-3}
 C. $y/3$
 D. $3/y$

8. Find x, y for which $\begin{pmatrix} 2x & 4 \\ 3 & y \end{pmatrix} \begin{pmatrix} 1 \\ 2 \end{pmatrix} = \begin{pmatrix} 10 \\ -1 \end{pmatrix}$

- A. (1, -2)
 B. (1, 2)
 C. (-1, 2)
 D. (2, -1)

9. Simplify $\frac{1/2}{2 \div \frac{1}{4} \text{ of } 32}$

- A. $3/256$
 B. $3/32$
 C. 6
 D. 85

10. The probability of either event A or B is $5/6$, while that of event B is $1/6$. If the probability of both A and B is $1/2$, what is the probability of event A.

- A. $3/4$
 B. $5/6$
 C. $1/4$
 D. $3/5$

11. The chances of three independent events X, Y and Z occurring are $1/2, 2/3, 1/4$ respectively. What are the chances of Y and Z only occurring?

- A. $1/8$
 B. $1/24$
 C. $1/12$
 D. $1/4$

12. Some red balls were put in a basket containing 12 white balls and 16 blue balls. If the probability of picking a red ball from the basket is $3/7$, how many red balls were introduced?

- A. 13
 B. 20
 C. 12
 D. 21

13. Find the coordinates of the mid-point of the line joining (2, 7) and (1, -6).

- A. $(\frac{1}{2}, \frac{13}{2})$
 B. $(\frac{3}{2}, \frac{1}{2})$
 C. $(\frac{1}{2}, \frac{1}{2})$
 D. $(\frac{3}{2}, \frac{13}{2})$

14. An equilateral triangle of sides 2cm is inscribed in a circle. Find the area of the circle.

- A. $4\pi \text{ cm}^2$
 B. $8\pi \text{ cm}^2$
 C. $4\pi/3 \text{ cm}^2$
 D. $3\pi/4 \text{ cm}^2$

15. The chord PQ of a circle is equal to the radius, r of the circle. Find the length of the arc PQ.

- A. $\frac{3\pi r}{4}$
- B. $\frac{\pi r}{4}$
- C. $\frac{\pi r}{3}$
- D. $\frac{\pi r}{6}$

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ANSWERS TO MATHEMATICS 2010/2011

1. A 2. B 3. B 4. B 5. B 6. A 7. A 8 A 9. C

10. - 11. D 12. D 13. B 14. C 15. C

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PHYSICS 2010/2011 QUESTIONS [SESSION 1]

1. Two forces whose resultant is 100N are at right angles to each other. If one of them makes an angle of 30° with the resultant, find the magnitude of the other force.
 - A. 8.66 N
 - B. 86.6 N
 - C. 50.0 N
 - D. 5.0 N

2. A body of weight W N rests on a smooth plane inclined at an angle θ° to the horizontal. The component of the weight down the slope is
 - A. $W \sin \theta$
 - B. $W \cos \theta$
 - C. $W \tan \theta$
 - D. $W \sec \theta$

3. A body of mass 100g moves with a velocity of 10.0ms^{-1} and collides with a wall. After the collision, the body moves with a velocity of 2.0ms^{-1} in the opposite direction. The change in momentum is
 - A. 8.0 Ns
 - B. 1.2 Ns
 - C. 12.0 Ns
 - D. 80 Ns

4. A 12V battery supplying a current of 20A was used to melt 1.5kg of ice at 0°C . Calculate the time required if the latent heat of fusion of ice is $336 \times 10^3\text{J/Kg}$.
 - A. 35.0 min
 - B. 3.5 min
 - C. 76 min
 - D. 21.0min

5. The light from the sun reaches the earth mainly by.
 - A. convection
 - B. conduction
 - C. radiation
 - D. reflection

6. One valid assumption of the kinetic theory of gases is that
 - A. the molecules are in random motion and the number of collisions is constant
 - B. the number of molecules increases with the pressure
 - C. the molecules of the gas are all identical and are very small in size
 - D. the number of molecules increases with temperature

7. An astronomical telescope is said to be in normal adjustment when the
 - A. eye is accommodated
 - B. focal length of objective lens is longer than that of the eye piece
 - C. final image is at the near point of the eye
 - D. final image is at infinity

8. Dispersion of light by a glass prism is due to the
 - A. different hidden colours of the glass
 - B. different speeds of their various colours in glass
 - C. defects in the glass
 - D. high density of glass

9. A guitar string of length 33cm is under a tension of 55N. If the fundamental frequency is 196Hz, find the speed of wave on string.
 - A. 6m/s
 - B. 0.33m/s
 - C. 129m/s

10. A transformer has 400 turns as its primary winding and 100 turns as secondary winding. If the primary coil is connected to a 12V source, the transformer functions as
 - A. a step-down transformer with secondary emf= 6V
 - B. a step-down transformer with secondary emf= 3V
 - C. a step-up transformer with secondary emf - 24V
 - D. a step-up transformer with secondary emf - 48V

11. A battery of internal resistance of 2Ω has a voltage of 4.0V when supplying a current of 2.0A. Calculate the terminal voltage if it now supplies a current of 3.0A.
 - A. 2.0V
 - B. 6.0V
 - C. 1.5V
 - D. 12.0V

12. The purpose of a dielectric material in a parallel plate capacitor is to
 - A. increase its capacitance
 - B. decrease its capacitance
 - C. insulate the plates from each other
 - D. increase the magnetic field between them

13. The name of an atom is associated with its atomic number Z , mass number A and neutron number N . Therefore:

- A. $A = Z + N$
- B. $Z = A + N$
- C. $N = A + Z$
- D. $A = N - Z$

14. A nuclear reaction initiated by adding neutron is called

- A. nuclear fission
- B. nuclear fusion
- C. nuclear enrichment
- D. radioactivity

15. The mass defect resulting from a thermonuclear reaction is $9.8 \times 10^{-30} \text{Kg}$. Calculate the energy released.

Take $c = 3 \times 10^8 \text{m/s}$

- A. $2.94 \times 10^{-22} \text{ J}$
- B. $8.82 \times 10^{-22} \text{ J}$
- C. $8.82 \times 10^{-14} \text{ J}$
- D. 8.82×10^{-13}

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ANSWERS TO PHYSICS 2010/2011 (SESSION 1)

1. C 2. A 3. B 4. A 5. C 6. C 7. D 8. B 9. D
10. B 11. B 12. A 13. A 14. A 15. D

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PHYSICS 2010/2011 QUESTIONS [SESSION 2]

1. Which of the following statements is true of the period of a simple pendulum?
 - A. it depends on the mass of the bob and the acceleration due to gravity
 - B. it depends on the length of the string and the acceleration due to gravity
 - C. it depends on the mass of the bob and the length of the string
 - D. it depends on the mass of the bob, the length of the string and acceleration due to gravity

2. A boat travels due east with a speed of 40ms^{-1} across a river flowing due south at 30ms^{-1} . Calculate the resultant speed of the boat.
 - A. 1.3 ms^{-1}
 - B. 10.0 ms^{-1}
 - C. 50.0 ms^{-1}
 - D. 70.0 ms^{-1}

3. The atmospheric pressure due to water is $1.3 \times 10^6\text{ Nm}^{-2}$. What is the total pressure at the bottom of an ocean 10m deep? (Density of water = 1000kgm^{-3} and $g=10\text{ms}^{-2}$)
 - A. $1.3 \times 10^7\text{ Nm}^{-2}$
 - B. $1.4 \times 10^6\text{ Nm}^{-2}$
 - C. $1.4 \times 10^4\text{ Nm}^{-2}$
 - D. $1.0 \times 10^5\text{ Nm}^{-2}$

4. Which of the following conditions will make water boil at a temperature of 100°C and saturation vapour pressure of 750mmHg?
 - A. decrease the external pressure
 - B. heat more rapidly at the same pressure
 - C. increase the external pressure
 - D. reduce the quantity of water

5. The density of a fixed mass of gas at constant pressure is
 - A. constant with temperature
 - B. directly proportional to the temperature
 - C. inversely proportional to the temperature
 - D. directly proportional to its volume

6. Which of the following equations is incorrect about an ideal gas (all the symbols have their usual meanings)
 - A. $PV=nRT$
 - B. $\frac{PV}{T} = \text{constant}$
 - C. $\frac{PV}{\frac{3}{2}nRT}$
 - D. $\frac{TV}{P} = \text{constant}$

7. The equation of a wave traveling Along the positive x-direction is given by $y = 0.20\sin(500t - 20x)$. The amplitude, angular frequency and wavelength of the wave are respectively given by
 - A. 0.2 cm, 500rad/s, 20 cm
 - B. 0.2 cm, 500rad/s, $0.1\pi\text{cm}$
 - C. 0.2 cm, $2 \times 10^{-3}\text{ rad/s}$, $0.1\pi\text{cm}$
 - D. 5 cm, $2 \times 10^{-3}\text{ rad/s}$, 0.05cm

8. When a plane mirror at which a ray of light is incident is rotated through an angle θ , the reflected ray will be rotated through
 - A. $\frac{1}{2}\theta$
 - B. θ
 - C. 2θ
 - D. 3θ

9. The quality of sound depends on its
 - A. frequency
 - B. wavelength
 - C. velocity
 - D. harmonics

10. The resistance of a piece of wire of length 20m and cross-sectional area $8 \times 10^{-6}\text{ m}^2$ has a resistance of 1Ω . The resistivity of the wire is
 - A. $3 \times 10^{-7}\ \Omega/\text{m}$
 - B. $4 \times 10^{-7}\ \Omega/\text{m}$
 - C. $1.6 \times 10^{-5}\ \Omega/\text{m}$
 - D. $4 \times 10^{-5}\ \Omega/\text{m}$

11. In an AC circuit that contains only a capacitor the voltage
 - A. leads the current by 90°
 - B. lags behind the current by 90°
 - C. leads the current by 180°
 - D. lags behind the current by 180°

12. The angle between the direction of the earth's magnetic field and the horizontal is called
 - A. angle of deviation
 - B. magnetic declination
 - C. magnetic meridian
 - D. angle of dip

13. Which of these statements is not correct concerning atomic structure?
 - A. negatively charged electrons orbit the positively charged nucleus
 - B. electromagnetic forces bind the electrons to the nucleus

C. protons and neutrons have approximately equal mass

D. the number of electrons orbiting the nucleus is equal to the number of nucleons

14. The half-life of a radioactive element is 9 days. Calculate the fraction that remains after 36 days.

A. $\frac{1}{32}$

B. $\frac{1}{16}$

C. $\frac{1}{4}$

D. $\frac{15}{32}$

15. One of the features of the fission process is that

A. it leads to chain reaction

B. its products are not radioactive

C. neutrons are p not released

D. mass and' energy are conserved

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ANSWERS TO PHYSICS 2010/11 (SESSION 2)

1. B 2. C 3. B 4. A 5. C 6. D 7. B 8. C 9. D

10. B 11. B 12. D 13. D 14. B 15. A

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CHEMISTRY 2010/2011 QUESTIONS [SESSION 1]

1. Crystallization is a better method of separation than precipitation because

A. precipitation tends to bring other solutes out of solution
 B. crystallization is applicable to all solids
 C. precipitation always involves salting-out
 D. crystallization can only be done at high temperatures

2. Which of the following is not a chemical change?

- A. burning of magnesium
 B. rusting of iron
 C. action of water on potassium
 D. dissolving powdered sulfur in carbon disulfide

3. An important ore of iron contains 72.36% iron and 27.64% oxygen. Determine its empirical formula

- A. FeO
 B. Fe₂O₃
 C. Fe₃O₄
 D. Fe₂O

4. Which of the following decreases when a given mass of gas is compressed to half its initial volume?

- A. average intermolecular distance
 B. frequency of collision
 C. number of molecules present
 D. atomic radius of each particle

5. The densities of two gases X and Y are 2.5 gdm⁻³ and 10.0 gdm⁻³ respectively. What is the rate of diffusion of X relative to Y?

- A. 1:2.5
 B. 2.5:1
 C. 1:2
 D. 2:1

6. The properties of elements are periodic functions of their

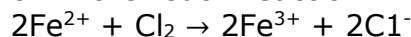
- A. atomic number
 B. atomic radius
 C. atomic volume
 D. mass number

7. Which of the following solutions containing only hydroxyl ions will liberate hydrogen gas when reacted with Mg metals?

- A. 1.0x 10⁻⁵ moldm⁻³
 B. 1.0x10⁻¹³ moldm⁻³
 C. 1.0x 10⁻³ moldm⁻³

D. 1.0x 10⁻² moldm⁻³

8. In the redox reaction



- A. Cl₂ is reduced because it has lost electrons
 B. Cl₂ is reduced because its oxidation number has decreased
 C. Fe²⁺ is reduced because it has lost electrons
 D. Fe²⁺ is reduced because it has gained electrons

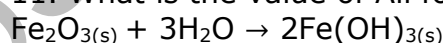
9. During electrolysis of molten sodium chloride;

- A. chlorine atom gains an electron
 B. chloride ion gains an electron
 C. chloride ion is oxidized
 D. sodium ion is oxidized

10. Coffee stains are removed with

- A. turpentine
 B. ammonia
 C. borax in water
 D. kerosene

11. What is the value of ΔH for this reaction?



Substance	$\Delta H_f(\text{KJ/mol})$
Fe ₂ O ₃ (s)	-824.2
Fe(OH) ₃ (s)	-823.0
H ₂ O(l)	-285.8

- A. 35.6 KJ
 B. 286. 0 KJ
 C. 858.6 KJ
 D. -536 KJ

12. N₂O₄(g) ⇌ 2NO₂(g) $\Delta H = +ve$

What happens to the equilibrium constant of the reaction above if the pressure is increased?

- A. it becomes zero
 B. it decreases
 C. it increases
 D. it is unaffected

13. Radioisotopes are used for the following EXCEPT

- A. development of photographic films
 B. generation of electricity
 C. radio carbon dating

D. tracers in chemical reactions

14. The common characteristics shared by iron and aluminium is that both

- A. are extracted by reduction method
- B. form only basic oxides
- C. show oxidation states of +2 and +3
- D. form soluble hydroxides

15. In the reaction: $\text{H}_3\text{C}-\text{C}\equiv\text{CH} + 2\text{HBr} \rightarrow \text{X}$, X is

- A. $\text{CH}_3\text{CBr}_2\text{CH}_3$
- B. $\text{CH}_3\text{CH}_2\text{CHBr}_2$
- C. $\text{CH}_3\text{CHBrCHBr}$
- D. $\text{CH}_2\text{BrCH}_2\text{CH}_2\text{Br}$

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CHEMISTRY 2010/2011 ANSWERS [Session 1]

1. A 2. D 3. A 4. A 5. D 6. A 7. B 8. B 9. C
10. C 11. A 12. D 13. A 14. D 15. A

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CHEMISTRY 2010/2011 QUESTIONS [SESSION 2]

1. The separation of oil and water with different boiling points can best be achieved by
 A. fractional distillation
 B. decantation
 C. evaporation
 D. using a separating funnel
2. Calculate the minimum volume of oxygen that is required for the complete combustion of a mixture of 20cm³ of CO and 25cm³ of hydrogen.
 A. 45cm³
 B. 22.5 cm³
 C. 20 cm³
 D. 10 cm³
3. An increase in temperature causes an increase in the pressure of a gas because there is an increase in the
 A. average velocity of the gas molecules
 B. number of collisions between the gas molecules
 C. density of the gas molecules
 D. free mean path between each molecule and the other
4. A liquid begins to boil when
 A. its vapour pressure is equal to the vapour pressure of its solid at a given temperature
 B. molecules start escaping from the surface
 C. its vapour pressure equals the atmospheric pressure
 D. its volume is slightly increased
5. If the relative rate of diffusion of a gas is 0.25 and that of Cl₂ under the same conditions is 0.20, calculate the relative molecular mass of the gas.
 A. 22.7
 B. 45.4
 C. 68.1
 D. 90.8
6. The following molecules contain hydrogen bonding EXCEPT
 A. ammonia
 B. ethanoic acid
 C. hydrogen fluoride
 D. Water
7. If 20cm³ of distilled water is added to 80cm³ of 0.50 mol/dm³ HCl solution, the new concentration of the acid is
 A. 0.10 mol/dm³
 B. 0.20 mol/dm³
 C. 0.40 mol/dm³
 D. 2.00 mol/dm³
8. What is H₂O₂ acting as in the equation below?

$$\text{H}_2\text{O}_2 + 2\text{H}^+ + 2\text{Fe}^{2+}$$

 A. oxidizing agent
 B. reducing agent
 C. an acid
 D. a base
9. A current was passed for 10 mins 20 secs and 0.1 mole of Cu was deposited. How many grams of silver will be deposited by the same quantity of electricity? {Ag=108}
 A. 10.8g
 B. 21.6 g
 C. 5.4 g
 D. 108 g
10. Which of the following statements is correct?
 A. dissolution of anhydrous CuSO₄ is exothermic while that of hydrated CuSO₄ is endothermic
 B. dissolution of anhydrous CuSO₄ is endothermic while that of hydrated CuSO₄ is exothermic
 C. dissolution of both anhydrous CuSO₄ and hydrated CuSO₄ is exothermic
 D. dissolution of both anhydrous CuSO₄ and hydrated CuSO₄, is endothermic
11. $\text{NO}_{(g)} + \text{CO}_{(g)} \rightarrow \text{N}_{2(g)} + \text{CO}_{2(g)} \Delta H = -89.3\text{KJ}$
 What conditions would favour maximum conversion of nitrogen(II) oxide and carbon(II)oxide in the reaction above?
 A. low temperature and high pressure
 B. high temperature and low pressure
 C. high temperature and high pressure
 D. low temperature and low pressure
- 11 Which of the alloys below does not contain copper?
 A. brass
 B. bronze
 C. type metal
 D. solder
13. $2\text{Al}_{(s)} + 2\text{NaOH}_{(aq)} + 6\text{H}_2\text{O}_{(l)} \rightarrow 2\text{NaAl}(\text{OH})_4_{(aq)} + 3\text{H}_2_{(g)}$
 From the equation, give the condition of reaction
 A. cold dil. NaOH
 B. hot. concentrated NaOH

- C. warm dilute NaOH
- D. hot dilute NaOH

14. Ethanol reacts With. aqueous sodium oxiodate(I) to give a bright yellow solid with a characteristic smell. The product is

- A. trichloromethane
- B. ethanal
- C. iodoethane
- D. triiodomethane

15. An alkanic acid has a molar mass of 102g. Derive its molecular formula and hence name the acid

- A. propanoic acid
- B. butanoic acid
- C. pentanoic acid
- D. hexanoic acid

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ANSWERS TO CHEMISTRY 2010/2011 (SESSION 2)

1. D 2. B 3. A 4. C 5. B 6. - 7. D 8. A 9. B
10. A 11. A 12. D 13. A 14. B 15. C

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USE OF ENGLISH 2011/2012 QUESTIONS

COMPREHENSION

INSTRUCTION: Read the following passage carefully, and answer the questions that follow.

If we examine the opportunities for education of girls or women in less developed countries, we usually find a dismal picture. In some countries, the ratio of boys to girls in secondary schools is more than seven to one. What happens to the girls? Often, they are kept at home to look after younger siblings and to perform a variety of domestic chores. Their education is not perceived as in any way equal in importance to that of the boys.

When a non-literate or barely literate girl reaches adolescence, she has little or no qualification for employment, even if her community provides any opportunity for the employment of women. The solution is to get her married as soon as possible, with the inevitable result that she produces children too soon, too often and too late. With no formal education, she is hardly aware that there is any alternative. In a study made in Thailand, it was noted that the literate woman marries later and ceases childbearing earlier than her non-literate counterpart. But the latter is so chained in her household by the necessities of gathering fuel, preparing food and tending children that she is very difficult to reach, even if health services, nutrition, education, maternal and child health centres are available in her community. She does not understand what they are intended to do.

1. The phrase "a dismal picture" means

- A. a dull show
- B. an interesting show
- C. a sad situation
- D. a dreadful appearance

2. According to the writer, most girls in less developed countries are not in school because

- A. they refuse to be educated
- B. they prefer getting married and having children
- C. the education of boys is rated higher
- D. the girls have no employment

3. The non-literate woman is very difficult to reach because she

- A. does not understand the value of education and health services
- B. is too far from the city and from school
- C. is not permitted to go out to attend clinics for health services
- D. can only gather fuel and prepare food

4. The phrase "too late" as used in the passage implies that the woman

- A. ought to have stopped producing children earlier
- B. goes on producing children when she ought to have stopped
- C. fails to marry early enough for her to produce children
- D. had all her children at an advanced age

5. The writer emphasizes that in less developed countries -

- A. the education of girls is not important
- B. the non-literate woman has some advantage because she has more
- C. the literate female is a threat to the male in employment
- D. there is a need to give boys and girls equal opportunities in education

LEXIS AND STRUCTURE

From the options in questions 6 and 7, choose the one that best completes the sentences.

6. One of the hens we bought _____ ten eggs already.

- A. have laid
- B. has lain
- C. has layed
- D. has laid

7. My friend and classmate _____ present when the girls insulted me.

- A. were
- B. is
- C. was
- D. are

In the following sentences, choose the word that is similar in meaning to the word underlined in each of the sentences.

8. The man's story gave us an inkling of what we went through during the war.

- A. a taste
- B. a possible idea
- C. a wrong notion
- D. a suggestion

9. The statement credited to the honourable member is an aspersion on the reputation of my company.

- A. a libel
- B. a slander
- C. a condemnation
- D. an abuse

In each of the questions 10 and 11, choose the option that has the same consonant sound as the one represented by the letter(s) underlined.

10. vision

- A. attention
- B. repression
- C. intention
- D. illusion

11. waste

- A. surtax
- B. cursed
- C. paused
- D. washed

In each of questions 12 and 13, the words in capitals have the emphatic stress. Choose the option that fits, the word in the sentence.

12. My brother bought EXACTLY twenty cups of rice.

- A. Who bought exactly twenty cups of beans?
- B. Did your mother sell exactly twenty cups of rice?
- C. Did your mother buy nearly twenty cups of rice?
- D. Did your sister buy exactly twenty cups of rice?

13. It is DANGEROUS to drive without spare tyre.

- A. Is it safe to drive with spare tyre?
- B. Is it safe to drive without spare tyre?
- C. Is it dangerous to fly without spare tyre?
- D. Is it safe to fly with spare tyre?

In the following sentences, choose the word that is opposite in meaning to the word underlined in each of the sentences.

14. Indiscreet actions have always led to regrets. that is why one should be _____

- A. judicious
- B. frugal
- C. circumspect
- D. thrifty

15. His remark during the send-off party was very apt to serve as a warning.

- A. inept
- B. Foolish
- C. ridiculous
- D. silly

ANSWERS TO USE OF ENGLISH 2011/2012

1. C 2. C 3. A 4. B 5. D 6. D 7. C 8. B 9. B

10. D 11. B 12. C 13. B 14. C 15. A

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MATHEMATICS 2011/2012 QUESTIONS

1. A bag contains x Nokia phones, $(2x-3)$ LG phones and $3x$ Samsung phones. If the probability of picking an LG phone in random from the bag is $\frac{1}{5}$, how many Samsung phones are in the bag?

- A. 12
- B. 3
- C. 6
- D. 9

2. The mean of the ages of Fifteen doctors in a certain hospital is 48 years. When five nurses joined them, the mean of the ages of the doctors and the nurses becomes 42 years. Find the mean of the ages of the five nurses.

- A. 39
- B. 24
- C. 28
- D. 33

3. If the probability of an event A is $\frac{3}{5}$ and the probability of both the event A and another event B is $\frac{3}{25}$, find the probability of B only.

- A. $\frac{12}{25}$
- B. $\frac{1}{5}$
- C. $\frac{9}{125}$
- D. $\frac{18}{25}$

4. The identity element with respect to the multiplication shown in the table below is:

*	X	Y	Z	W
X	W	Z	X	W
Y	Z	W	Y	X
Z	X	Y	Z	W
W	X	Y	W	Z

- A. Y
- B. X
- C. W
- D. Z

5. Find the value of x such that

$$2^1 \times 2^{x+1} = \sqrt{32}$$

- A. $\frac{3}{2}$
- B. $\frac{7}{4}$
- C. $\frac{3}{4}$
- D. $-\frac{3}{4}$

6. If the sum of the first n terms of a sequence is $2n^2+1$, find the n th term of the sequence.

- A. $2(2n+1)$
- B. $4n + 1$

- C. $4n$
- D. $2(2n - 1)$

7. Expresses $\frac{312_6}{14_7}$ as a number in base 3.

- A. 201_3
- B. 11_3
- C. 102_3
- D. 202_3

8. Simplify $10^{\frac{1}{2}} \times 20^{x+1} \times 125^{-\frac{1}{2}} \div 32^{\frac{x}{2}}$

- A. $\frac{1}{20}$
- B. 20
- C. 20^x
- D. 20^{x-1}

9. In a class of 54 students, each student offers at least one of English and French. If the sum of those that offer both subjects is half the number that offer English only and the number that offer French only is twice the number that offer both subjects, find the number of students that offer English only.

- A. 12
- B. 30
- C. 36
- D. 18

10. Evaluate $\int_{-4}^0 \sqrt{1-2x} dx$

- A. $\frac{52}{3}$
- B. $-\frac{26}{3}$
- C. $\frac{26}{3}$
- D. $-\frac{1}{6}$

11. The first derivative of $y = 3\cos^2 4x$ is

- A. $24\sin 4x$
- B. $-24\cos 4x \sin x$
- C. $-12\sin 8x$
- D. $12\sin 8x$

12. The integral of $3x-2$ which passes the point $(1, -\frac{5}{6})$ is

- A. $\frac{1}{6}(3x-2)^2 - 1$
- B. $-\frac{1}{6}(3x-2)^2 - 1$
- C. $3x^2 - 2x + \frac{11}{6}$
- D. $\frac{1}{6}(3x-2)^2 + 1$

13. A pyramid 12cm high stands on a rectangular base of length 7cm and width 5cm. Calculate the volume of the pyramid.

- A. 420 cm^3
- B. 140 cm^3
- C. 210 cm^3
- D. 47 cm^3

14. Find the number of sides of a regular polygon if each of the interior angle of the polygon is 150°

- A. 6
- B. 9
- C. 8
- D. 12

15. A fly at a point P moves such that its distance from a point O is 21cm. If the fly covers a distance of 22cm before reaching a point Q, calculate angle POQ.

- A. 63.2°
- B. 60°
- C. 31.6°
- D. 120°

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ANSWERS TO MATHEMATICS 2011/2012

1. D 2. B 3. B 4. D 5. C 6. D 7. C 8. B 9. C
10. D 11. C 12. A 13. C 14. D 15. B

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PHYSICS 2011/2012 QUESTIONS

1. Two stones P and Q of different masses were projected horizontally at different angles of 15° and 75° respectively but with the same velocity.

The ranges covered by the stones will be

- A. greater for P
- B. greater for Q
- C. same for P and Q
- D. greater for the heavier of the two stones

2. If the torque on a body is zero, the angular momentum of the body will

- A. decrease continuously to zero
- B. increase then decrease to zero
- C. be constant
- D. increase continually

3. For which of the following quantities is the derived unit ML^2T^{-2} correct?

- I. Moment of force
- II. Acceleration
- III. Work
- IV. Momentum

- A. I and II
- B. I and III
- C. III and W
- D. II only

4. In which of the following are the substances arranged in the descending order of their conductivities?

- A. copper, steel, glass
- B. steel, copper, glass
- C. copper, glass, steel
- D. glass, copper, steel

5. The *linear expansivity* of brass is $2 \times 10^{-5}/^\circ C$; the volume of a piece of brass 10 cm^3 at $0^\circ C$, what will be its volume at $100^\circ C$?

- A. 10.02 cm^3
- B. 10.04 cm^3
- C. 10.06 cm^3
- D. 10.20 cm^3

6. The thermometric property of the thermocouple is that its

- A. emf changes with temperature
- B. resistance changes with temperature
- C. volume changes with temperature.
- D. resistance changes with length

7. A concave lens of focal length 20 cm forms an image $\frac{1}{2}$ the size of the object, the object distance is

- A. 100 cm
- B. 30 cm
- C. 60 cm
- D. 40 cm

8. The quality of sound depends on

- A. frequency
- B. wavelength
- C. velocity
- D. harmonics

9. A student with a sight defect has a least distance of distinct vision of 150 cm. For him to read a material placed at a distance of 25 cm, what is the focal length of the glasses he should wear?

- A. 15.0 cm
- B. 17.0 cm
- C. 21.4 cm
- D. 30.0 cm

10. A dynamo primarily converts

- A. mechanical energy into electrical energy
- B. electrical energy into kinetic energy
- C. potential energy into kinetic energy
- D. kinetic energy into potential energy

11. Three capacitors $2 \mu F$, $3 \mu F$ and $6 \mu F$ are connected in series. If the pd across the system is 12V, the pd across the $6 \mu F$ capacitor is

- A. 4V
- B. 6V
- C. 12V
- D. 2V

12. A current of 0.5A flows through a resistor when connected to a 40V battery. The energy dissipated in 2 minutes is

- A. 1200 J
- B. 1500 J
- C. 2400 J
- D. 9600 J

13. Which of the following is most strongly deflected by a magnetic field?

- A. γ -rays
- B. X-rays
- C. β -rays
- D. α - rays

14. The major difference between semiconductor and a pure metal is that
A. metals are harder than semiconductors
B. the resistance of metals decreases with temperature while the reverse is the case with semiconductors
C. the resistance of metals increases with temperature while the reverse is the case with semiconductors
D. metals have forbidden band gaps while semiconductors do not have

15. A light of energy 5 eV falls on a metal and the electrons with a maximum kinetic energy of 2 eV are ejected. The work function of the metal is
A. 0.4eV
B. 2.5 eV
C. 3.0 eV
D. 7.0 eV

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ANSWERS TO PHYSICS 2011/2012

1. C 2. C 3. B 4. A 5. C 6. A 7. B 8. D 9. C
10. A 11. D 12. C 13. C 14. C 15. C

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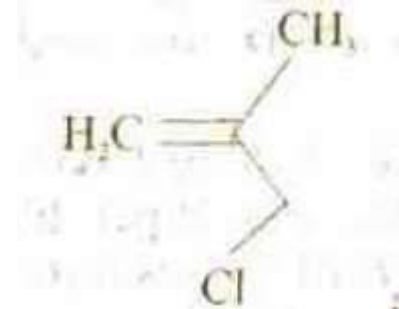
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CHEMISTRY 2011/2012 QUESTIONS

1. Addition of water to calcium oxide leads to
- a physical change
 - a chemical change
 - the formation of a mixture
 - an endothermic reaction
2. 15 g of impure Na_2CO_3 reacted with excess HNO_3 . If 0.1 mole of CO_2 is produced, what is the percentage purity of the Na_2CO_3 ? [Na=23, C=12, O =16]
- 35.3%
 - 10.0%
 - 70.66%
 - 90.0%
3. 0.14g of a hydride of carbon occupies 112.0 cm^3 at STP when evaporated. The ratio of carbon to hydrogen is 1:2. The relative molecular formula is
- C_2H_4
 - C_3H_6
 - C_4H_8
 - C_6H_{12}
4. A gas X diffuses twice as fast as a gas Y under the same conditions. If the relative molecular mass of Y is 112, calculate the relative molecular mass of X.
- 28
 - 14
 - 56
 - 120
5. In the periodic table, what is the property that decreases along the period and increases down the group?
- Atomic number
 - Electron affinity
 - Ionization potential
 - Ionic radius
6. 10 cm^3 of 0.1 M HCL are added to 10 cm^3 of NaOH solution containing 8 g of NaOH per dm^3 of solution. What is the pH of the resulting solution?
- 11
 - 13
 - 7
 - 8
7. What is the formula of sodium gallate if gallium (Ga) shows an oxidation number of +3?
- NaGaO_3
 - $\text{Na}_2\text{Ga}(\text{OH})_2$
 - $\text{NaGa}(\text{OH})_3$
 - $\text{NaGa}(\text{OH})_4$
8. The mass of Ag deposited when a current of 10 A is passed through a solution of silver salt for 4830 secs is [Ag = 108, 1F = 96500C]
- 54.0 g
 - 27.0 g
 - 13.5 g
 - 108.0 g
9. The solubility of alkanols in water is due to
- their covalent nature
 - hydrogen bond
 - their low boiling point
 - their ionic character
10. If a reaction is exothermic and there is a great disorder, it means
- the reaction is in a state of equilibrium
 - there will be a large increase in free energy
 - there will be a large decrease in free energy
 - the reaction is static
11. In what way is the equilibrium constant for the forward reaction related to that of the reverse reaction?
- the two equilibrium constants are identical
 - the product of the two is expected to be one
 - the product of the two is always greater than one
 - the addition of the two is expected to be one
12. Natural radioactivity is the random spontaneous disintegration of the nucleus of heavy isotope certain elements with the emission of
- α , β and X-rays
 - α , β and γ -rays
 - α , X and γ -rays
 - β , X and γ -rays
13. Mg ribbon was allowed to burn inside a gas jar containing gas P leaving a white solid residue Q. Addition of water to Q liberated a gas which produces dense white fumes with a drop of hydrochloric acid. The gas P was
- Nitrogen
 - Chlorine

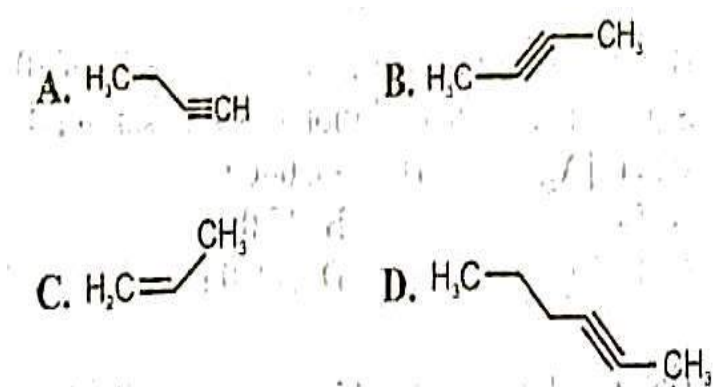
- C. Oxygen
D. Sulphur(IV) oxide

14. The IUPAC name for the compound



- A. 1-chloro-2-methylprop-2,3-ene
B. 1-chloro-2-methylprop-2-ene
C. 3-chloro-2-methylprop-1-ene
D. 3-chloro-2-methylprop-1,2-ene

15. Which of the following behaves like ethyne?



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ANSWERS TO CHEMISTRY 2011/2012

1. B 2. C 3. A 4. A 5. D 6. A 7. D 8. A 9. B
10. C 11. B 12. B 13. A 14. C 15. B

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USE OF ENGLISH 2012/2013 QUESTIONS

COMPREHENSION

INSTRUCTION: Read the following passage and answer the questions that follow.

The diseases afflicting Western societies have undergone dramatic changes. In the course of a century, so many mass killers have vanished such that two-thirds of all deaths are now associated with the diseases of old age. Those who die young are, more often than not, the victims of accident, violence and suicide.

These changes in public health are generally equated with progress and are attributed to more or better medical care. In fact, there is no evidence of any direct relationship between changing disease patterns and the so-called progress of medicine.

The impotence of medical services to change life expectancy and the insignificance of much contemporary clinical care in the curing of diseases are all obvious, well documented but well suppressed. Neither the proportion of doctors in a population nor the quality of the clinical tools at their disposal nor the number of hospital beds is a causal factor in the striking changes in disease patterns. The new techniques available to recognize and treat such conditions as pernicious anaemia and hypertension, or to correct congenital malformations by surgical interventions, increase our understanding of disease but do not reduce its incidence.

The fact that there are more doctors where certain diseases have become rare has little to do with their ability to control or eliminate them. It simply means that doctors, more than other professionals, determine where they work. Consequently, they tend to gather where the climate is healthy, where the water is clean, and where people work and can pay for their services.

1. The statement 'the diseases afflicting Western societies have undergone dramatic changes', implies that
- changes have taken place in the mode of disease affliction
 - medical services have been important in charming life expectancy

- a lot of significant progress has taken place in public health
- deaths from diseases in Western societies are minimal

2. The writer is of the view that the diseases which prevail in contemporary Western societies
- resulted from modern life styles
 - are concentrated among the elderly
 - kill many people at once
 - are resistant to drugs

3. The author thinks that the presence of a large number of doctors in a community
- does not have much effect on the control of - diseases
 - distinguishes the true facts about diseases
 - controls the spread-of diseases
 - improves the overall quality of life in the community

4. Many doctors, according to the passage, choose to live where
- research facilities are available
 - they are most needed
 - they can be near colleagues
 - conditions are more in their favour

Correct the following sentences by choosing one the words which you consider appropriate

5. His father has a _____.
- round wooden beautiful table
 - wooden round beautiful table
 - beautiful wooden round table
 - beautiful round wooden table
6. Anichebe is one of the.... sportsmen
- ten highly your Nigerian talented
 - ten highly talented Nigerian young
 - highly talented ten young Nigerian
 - ten young highly talented Nigerian

7. Tell her I can't attend the party _____ a cold.
- I am having
 - I have had
 - I have got
 - I have

In each of the questions 8 and 9, choose the word(s) that best completes the meaning in the sentence

8. Three policemen were killed when the bomb they were trying to _____ exploded.

- A. difuse
- B. diffuse
- C. defuse
- D. deffuse

9. The discontented men _____ up trouble among the workers.

- A. starred
- B. steered
- C. stirred
- D. started

In each of the questions 10 to 12, choose the option that has the same consonant sound as the one represented by the letter(s) underlined

10. Yolk

- A. Could
- B. Build
- C. Silk
- D. Sulk

11. Osmosis

- A. Ostrich
- B. Music
- C. Scene
- D. Sign

12. Younger

- A. Singer
- B. Longer
- C. Banger
- D. Ringer

In each of the questions 13 to 15, choose the correct stress pattern from the options. The syllables are written in capital letters.

13. A. Reverential

- B. reveREntial
- C. reVErential
- D. reverential

14. A. orGANizer

- B. ORganizer
- C. orgaNizer
- D. organizer

15. A. ulTIImatum

- B. ulTiMAtum
- C. Ultimatum
- D. ultimaTUM

ANSWERS TO USE OF ENGLISH 2012/2013

1. A 2. B 3. A 4. D 5. D 6. D 7. C 8. C 9. C

10. A 11. B 12. B 13. B 14. B 15. B

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MATHEMATICS 2012/2013 QUESTIONS

MATHEMATICS 2012/2013 QUESTIONS

1. If p , q and r are in the ratio 6:4:5, find the value of $\frac{3p-q}{4q+r}$

- A. $\frac{2}{3}$
 B. $\frac{1}{2}$
 C. $\frac{3}{5}$
 D. $\frac{5}{3}$

2. If $\log_{10} 2 = x$ and $\log_{10} 3 = y$, express $\log_{10} 10 + 2\log_{10} 6$ in terms of x and y .

- A. $1 - x + 2y$
 B. $1 + 2x + 2y$
 C. $1 + x + 2y$
 D. $1 - x + y$

3. Simplify $\frac{1^{1/2}}{2^{1/4} \text{ of } 16}$

- A. 3
 B. $\frac{3}{16}$
 C. $\frac{1}{3}$
 D. $\frac{3}{4}$

4. If the 7th term of an AP is twice the third term and the sum of the first four terms is 42, find the common difference.

- A. $\frac{3}{2}$
 B. 2
 C. 3
 D. 6

5. Find the sum to infinity of the series $2 + \frac{3}{2} + \frac{9}{8} + \frac{27}{32} + \dots$

- A. 8
 B. $\frac{1}{2}$
 C. 2
 D. 4

6. Evaluate $\left| \frac{\cos 2\theta - 2\sin\theta}{2\sin\theta} \right|$

- A. 4
 B. 2
 C. -4
 D. -2

7. The point A has Coordinates (5, 16) and the point B has coordinates (-4, 4). The variable point P has coordinates (x, y) and moves on a path such that $AP = 2BP$. Find the Cartesian equation of the path of P.

- A. $(x+7)^2 + y^2 = 100$
 B. $(x-7)^2 + y^2 = 100$
 C. $(x+7)^2 + y^2 + 100 = 0$
 D. $(x-7)^2 + y^2 + 100 = 0$

8. Simplify $4\sin\theta\sin\left(\frac{\pi}{3} - \theta\right)\sin\left(\frac{\pi}{3} + \theta\right)$

- A. $\sin 3\theta$
 B. $\cos 3\theta$
 C. $\sin 3\theta$
 D. $\cos 3\theta$

9. The distance points P and Q with coordinates $(ap^2, 2ap)$ and $(aq^2, 2aq)$ respectively lie on the curve $y^2 = 4ax$. The tangents to the curve at P and Q meet at the point T. Find the coordinates of T if $p \neq q$

- A. $(apq, a(p+q))$
 B. $(a(p+q), apq)$
 C. $(-apq, a(p+q))$
 D. $(apq, -a(p+q))$

10. If $y = 2\cos(3x - \pi)$, then $\frac{dy}{dx}$ is

- A. $6\sin 3x$
 B. $-6\sin 3x$
 C. $6\sin(3x - \pi)$
 D. $-6\sin(3x - \pi)$

11. Find the coordinates of the turning point of the curve $y = 27x^3 - 27x^2 + 4$

- A. (4, 0), $(0, \frac{2}{3})$
 B. (0, 4), $(\frac{2}{3}, 0)$
 C. (0, -4), $(-\frac{2}{3}, 0)$
 D. (0, -4), $(\frac{2}{3}, 0)$

12. If $y = (1 + 2x)^3$, find $\frac{dy}{dx}$ at $x = -1$

- A. -3
 B. 3
 C. -6
 D. 6

13. An examiner has five envelopes labelled A to E for each of the five options of a question paper. In how many ways can the examiner place one option of the question paper in each envelope without getting every option in the envelope?

- A. 119
 B. 120
 C. 25
 D. 24

14. The distribution below shows the money received by a group of students who shared

12,000:00 with a teacher. How much did the teacher receive?

Amt. Received in ₦	200	350	700	1000
No of Students	1	2	3	5

15. Two numbers are removed at random from the numbers -1, 0, 1. What is the probability that the product of the numbers removed is zero?

- A. $\frac{1}{3}$
 B. $\frac{2}{3}$
 C. $\frac{5}{9}$
 D. $\frac{4}{9}$

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MATHEMATICS 2012/2013 ANSWERS

1. A 2. B 3. A 4. C 5. A 6. B 7. A 8. C 9. A
 10. D 11. B 12. D 13. B 14. D 15. C

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PHYSICS 2012/2013 QUESTIONS

1. The force on a current carrying conductor in a magnetic field is greatest when the
- conductor makes an angle of 60° with the field
 - force is independent of the angle between the conductor and the field
 - conductor is parallel with the field
 - conductor is at right angles with the field
2. A magnetic field is said to exist at a point if a force is
- exerted on a stationary charge at that point
 - exerted on a moving charge at that point
 - deflected at that point
 - strengthened at that point
3. In an a.c circuit that contains only a capacitor, the voltage lags behind the current by
- 90°
 - 180°
 - 30°
 - 60°
4. The particle emitted when ${}_{19}^{39}\text{K}$ decays to ${}_{19}^{39}\text{K}$ is
- gamma
 - beta
 - electron
 - alpha
5. The particle and wave nature of matter is demonstrated by
- Bragg's equation
 - de Broglie equation
 - Schrodinger equation
 - Pauli's exclusive principle
6. The ray which causes gas molecules to glow is
- cathode ray
 - anode ray
 - molecular ray
 - gamma ray
7. If the distance between two suspended masses 10 Kg each is tripled, the gravitational force of attraction between them is
- reduced by one-half
 - increased by one-third
 - decreased by one-third
 - decreased by one-ninth
8. If the radius of the earth is $6.4 \times 10^6\text{m}$, the escape velocity of a satellite from the earth (take $g=10 \text{ ms}^{-2}$)
- $1.13 \times 10^4 \text{ ms}^{-1}$
 - $9.00 \times 10^3 \text{ ms}^{-1}$
 - $8.00 \times 10^3 \text{ ms}^{-1}$
 - $1.27 \times 10^4 \text{ ms}^{-1}$
9. If a body of mass 5 Kg is thrown vertically upwards with a velocity U , at what height will the potential energy equal to the kinetic energy?
- $h = \frac{U^2}{g}$
 - $h = \frac{U^2}{4g}$
 - $h = \frac{2U^2}{g}$
 - $h = \frac{U^2}{2g}$
10. The rate of heat loss by a body is proportional to the
- difference in temperature between the body and its surrounding
 - temperature of its surrounding
 - ratio of the temperature of the body to that of the surrounding
 - temperature of the body
11. In a gas experiment, the pressure of the gas is plotted against the reciprocal of the volume of the gas at constant temperature, the unit of the slope of the resulting curve is
- force
 - temperature
 - power
 - work
12. A bar of initial length l_0 is heated through a temperature range $\Delta\theta$ to a new length l . The linear expansivity of the bar is -
- $\frac{l-l_0}{l\Delta\theta}$
 - $\frac{l-l}{l_0\Delta\theta}$
 - $l_0(l+\Delta\theta)$
 - $\frac{l-l_0}{l(l+\Delta\theta)}$
13. The real depth of a pond is 6.0 in. A boy observes a fish at the bottom of the pond. What is the apparent depth if the refractive index is $\frac{4}{3}$?
- 8.0m
 - 5.5m
 - 5.0m

D. 4.5m

14. If U is the object distance and V the image distance, which of the following expressions gives the linear magnification produced by a convex lens of focal length f ?

A. $\frac{U}{f} - f$

B. $\frac{U}{V} + f$

C. $\frac{V}{f} + 1$

D. $\frac{V}{f} - 1$

15. A light wave has a wavelength of 500 nm in air. The frequency of the wave is

A. 3.0×10^{14} Hz

B. 6.0×10^{14} Hz

C. 6.0×10^{12} Hz

D. 2.5×10^{14} Hz

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ANSWERS TO PHYSICS 2012/2013

1. D 2. B 3. A 4. A 5. B 6. A 7. D 8. A 9. D

10. A 11. D 12. B 13. D 14. D 15. B

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CHEMISTRY 2012/2013 QUESTIONS

1. Which of the following statements is incorrect?
- The addition of Water to quicklime is an example of a physical change
 - A chemical change is irreversible and a no substance is formed
 - A physical change can easily be reversed and no new substances are formed
 - Separating a mixture by distillation is an example of physical change
2. 20 g of calcium trioxocarbonate(IV) is heated to a constant mass and 11.2 g of calcium oxide is left as residue. The mass of the gaseous product left is _____
[Ca = 40, C 12, O = 16]
- 11.2 g
 - 44 g
 - 2.2 g
 - 8.8 g
3. The vapour pressure of water at 15 °C is 13 mmHg. At a barometric pressure of 747 mmHg, 2 dm³ of nitrogen gas is collected over water at 15 °C, the pressure of nitrogen gas is
- 760 mmHg
 - 747 mmHg
 - 734 mmHg
 - 114.3 mmHg
4. Elements X, Y and Z belong to groups I, V and VI respectively. Which of the following is TRUE about the bond types of XZ and YZ₃?
- Both are electrovalent
 - Both are covalent
 - XZ is electrovalent and YZ is covalent
 - XZ is covalent and YZ₃ is electrovalent
5. Which of the following is a double salt?
- K₃Fe(CN)₆
 - KAl(SO₄)₂ · 12H₂O
 - Pb(OH)₂ · 2PbCO₃
 - KHSO₄
6. Find the value all in the equation
 $XO_3^{n-} + 4H^+ + 3e^- \rightarrow XO + 2H_2O$
- 1
 - 2
 - 3
 - 5
7. Corrosion in metals is an example of
- electrochemical process
 - half-cell reaction
 - metal-plating device
 - metal coupling device
8. An example of a suspension of solid particles in a gas is
- Harmattan
 - Aerosol spray
 - Fogs
 - Emulsion
9. In which of the following is the change in entropy positive?'
- $2H_2O_{(g)} + SO_{(g)} \rightarrow 2H_2O_{(l)} + 3S_{(s)}$
 - $H_2O_{(s)} \rightarrow H_2O_{(l)}$
 - $N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)}$
 - $Cu^{2+}_{(aq)} + Fe_{(s)} \rightarrow Fe^{2+}_{(aq)} + Cu_{(s)}$
10. The formation of SO₃ in the equation above will be favoured by
- addition of SO₃
 - high pressure
 - high temperature and low pressure
 - high temperature and addition of catalyst
11. When ${}_{92}^{238}U$ emits an x-ray and a β-ray, the product X has a mass number and an atomic number respectively
- 234 and 90
 - 234 and 91
 - 230 and 88
 - 238 and 93
12. The producer gas is a mixture of
- CO and CO₂
 - CO and N₂
 - CO and H₂
 - CO and CO₂
13. The IUPAC name of the compound below is H₃CCH(CH₃)CHCHCH₃
- Hex-2-ene
 - 2-methylpent-4-ene
 - Hex-3-ene
 - 4-methylpent-2-ene
14. Ethanol reacts with aqueous Sodium oxiodate(I) to give a bright yellow solid with a characteristic smell. The product is
- trichloromethane
 - triiodomethane
 - iodoethane
 - ethanal

15. Plastics which lose their plasticity on being subjected to heat are said to be

- A. biodegradable
- B. polymeric
- C. thermosets
- D. thermoplastics

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ANSWERS TO CHEMISTRY 2012/2013

1. A 2. D 3. C 4. C 5. B 6. A 7. B 8. A 9. B

10. B 11. D 12. B 13. D 14. D 15. C

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ENGLISH 2014/2015 QUESTIONS [SECTION 1]**COMPREHENSION**

Instruction: Read the following passage and answer the questions that follow

It is a common axiom that the youths are the leaders of tomorrow. Because this statement has almost become a cliché, it is often taken for granted. But the reality is that as a society, we need to invest in, encourage and support the nation's youths, in order to realise a better future for the country.

As a company, Guinness Nigeria believes that the best investment in youth development is in the area of education. This belief has informed the numerous initiatives we implemented in the past or are still implementing as far as youth development is concerned.

We have therefore taken great interest in the educational sector and made significant contributions to it. Apart from contributing to the government-established Education Trust Fund (EIF), we also pursue other private initiatives to drive our interest in the Nigerian youth.

Such private industries included the Guinness Leeds Scholarship Scheme and the Chevening Scholarship operated in partnership with the British Council. Targeted at young Nigerians of university age and post-graduate students respectively, the two scholarship schemes were of immense benefit to the education-thirsty citizens of this country.

1. Axiom means

- A. a statement that everyone believes is true
- B. a statement that has become common
- C. a statement that is often taken for granted
- D. none of the above

2. Cliché means

- A. a statement which shows the reality of the society
- B. a statement which has become overused to the point of losing its effect
- C. a statement which is often taken for granted other companies
- D. a reason why axioms are taken for granted

3. The role of Guinness Nigeria in youth development is

- A. providing scholarships
- B. supporting the government
- C. building private universities in Nigeria
- D. encouraging the society to invest in the youth

4. Nigerian youths are thirsty for

- A. education
- B. alcoholic drink
- C. scholarships
- D. all of the above

In the question 5, select the option that best explains the information conveyed in the sentence.

5. Do you mind my smoking here? No, I don't mind

- A. You can smoke here
- B. No, you can smoke outside
- C. No, you cannot smoke here
- D. You can smoke anywhere

6. From the options below, choose the correct syllabic division of the word *Photographic*.

- A. Pho-to-graph-ic
- B. Pho-tog-ra-phic
- C. Pho-to-gra-phic
- D. Photo-graph-ic

In question 7, choose the option nearest in meaning to the word in italics.

7. Ngozi was of a *permanent* job.

- A. regular
- B. temporary
- C. long-lasting
- D. popular

In each of the following questions choose the word or phrase which best fills the gap

8. He _____ the generator immediately the light was restored.

- A. off
- B. switched off
- C. put out
- D. put off

9. Emeka _____ his father.

- A. took after
- B. took on
- C. took to
- D. took up

10. Now that the examination is fast approaching, the teachers have been instructed to _____ their lessons.

- A. round over
- B. round up
- C. round off
- D. round in

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USE OF ENGLISH 2014/2015 ANSWERS [SESSION 1]

COMPREHENSION

1. A 2. B 3. B 4. A

LEXIS AND STRUCTURE

5. A 6. A 7. C 8. B 9. A 10. C

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ENGLISH 2014/2015 QUESTIONS [SESSION 2]

In questions 1 and 2, choose the option opposite in meaning to the word in italics

- The class prefect was one of the main actors of the occasion _____.
A. critics
B. spectators
C. guests
D. performers
- The governor *declined* to give audience to the journalist.
A. ignored
B. accepted
C. forgot
D. rejected

In the following sentences, choose the word that best completes the meaning.

- After the strike the traders the prices of their goods,
A. beat up
B. beat down
C. beat on
D. beat off
- The judge the decision of the lower court.
A. held up
B. abolished
C. upheld
D. reversed

- Professor Nweke _____ since 1984.
A. has been teaching
B. has taught
C. was teaching
D. had been taught

In questions 6 and 7, choose the option nearest in meaning to the word in italics.

- Our aunt has expressed deep appreciation for Onyinye's *invaluable* assistance during the party.
A. immeasurable
B. praiseworthy
C. selfless
D. worthless

- Many world leaders have continued to condemn the South African Prime Minister for his *truculent* posture.
A. impetuous
B. impertinent
C. aggressive
D. impervious

- It is usually hard to change the course of action when one crosses the Rubicon. The underlined expression, as used in this sentence, means to.
A. pass through a place called Rubicon
B. cross a river called Rubicon
C. cross a bridge called Rubicon
D. be irrevocably committed

In the following question, select the option that best explains the information conveyed in the sentence.

- "It is irrational for one to count one's chickens before the eggs hatched."
A. The eggs are not to be broken
B. Not everything works out as outlined
C. One should not regard one's eggs as chickens
D. It is senseless to hatch one's eggs prematurely

In the following question, the word in capital letters has an emphatic stress. Choose the option that best fits the expression in the sentence.

- He wrote it **BOLDLY**.
A. Did she write it boldly?
B. Did he draw it boldly?
C. How did he write it?
D. Will he write it boldly?

ANSWERS TO USE OF ENGLISH 2014/2015 [SESSION 2]

1. B 2. B 3. B 4. C 5. A 6. A 7. C 8. D 9. B
10. C

PHYSICS 2014/2015 QUESTIONS [SESSION 1]

- Which of the following is most strongly deflected by a magnetic field?
 - gamma rays
 - alpha particles
 - beta particles
 - X-ray
- The principle of operation of an induction coil is based on
 - Ohm's law
 - Ampere's law
 - Faraday's law
 - Coulomb's law
- A ray of light is incident on a plane surface at an angle of 40° . What is the angle of reflection?
 - 40°
 - 80°
 - 200°
 - 50°
- The particle and wave nature of matter are demonstrated in the equation
 - $\lambda = \frac{hc}{E}$
 - $\lambda = \frac{c}{f}$
 - $\lambda = \frac{h}{p}$
 - $\lambda = 2d \sin \theta$
- A 12-V battery has an internal resistance of 0.5 ohms. If a cable of 1.0 ohms resistance is connected across the two terminals of the battery, the power dissipated is
 - 64W
 - 96W
 - 9.6W
 - 192W
- The force on a current carrying conductor in a magnetic field is greatest when the
 - conductor makes an angle 60° with the field
 - force is independent of the angle between the field and the conductor
 - conductor is parallel with the field
 - conductor is at right angles with the field
- The kind of nuclear reaction-initiated bombardment of neutron is
 - nuclear fusion
 - nuclear fission
 - nuclear fusion

- radioactivity
- Two balls of masses 40 g and 60 g respectively, are attached firmly to the ends of a light metre rule. The centre of gravity of the system is
 - at the mid-point of the metre rule
 - 40 cm from the lighter mass
 - 40 cm from the heavier mass
 - 60 cm from the heavier mass
 - Hydrogen molecules escape from the topmost layer of the earth's atmosphere because
 - hydrogen has negligible mass and has speed above escape velocity
 - the gravitational pull of the earth is negligible in the atmosphere
 - the intermolecular forces in the atmosphere negligible
 - escape velocity is negligible compared speed of hydrogen molecules
 - If the refractive index of a medium is $\frac{2}{\sqrt{3}}$, what is the critical angle?
 - 90°
 - 45°
 - 60°
 - 30°

ANSWERS TO PHYSICS 2014/2015 (SESSION 1)

1. C 2. C 3. A 4. C 5. A 6. D 7. B 8. C 9. A
10. C

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PHYSICS 2014/2015 QUESTIONS [SESSION 2]

- The half-life of a radioactive element is 9 days. Calculate the fraction that remains after 36 days.
 - $\frac{1}{16}$
 - $\frac{1}{32}$
 - $\frac{1}{8}$
 - $\frac{1}{64}$
- The purpose of a dielectric material in a parallel plate capacitor is to
 - increase its capacitance
 - decrease its capacitance
 - insulate the plates from each other
 - increase the magnetic field between them
- A 12V battery has an internal resistance of 0.5 ohms. If a cable of 1.0 ohms resistance is connected across the two terminals of the battery; the power dissipated is
 - 64W
 - 96W
 - 9.6W
 - 192W
- The force constant of the load-extension graph of a spring is given by the
 - slope of the linear portion of the graph
 - length of the linear portion of the graph
 - area under the linear portion of the graph
 - area under the entire graph
- Which of the following properties is exclusive to electromagnetic waves?
 - reflection
 - refraction
 - polarization
 - diffraction
- Which of the following is FALSE about gases in kinetic theory of gases?
 - gases have large molecules
 - the molecules of a gas are all identical
 - the molecules of a gas collide with one another and with the walls of the container
 - as temperature increases, the number of collisions made by the gas molecules increase
- For a long-sighted person, light rays from a point on a very distant object is focused
 - in front of the retina
 - behind the-retina
 - on the retina,
 - behind the retina by a diverging lens

- A copper wire has a resistance of 25 m Ω at 20°C. When the wire is carrying current, heat produced by the current causes its temperature to increase by 27°C. What is the change in the wire's resistance? [take temperature coefficient of resistivity of 'copper, $\alpha = 6.8 \times 10^{-3}$]
 - 1.2 m Ω
 - 11.8 m Ω
 - 2.3 m Ω
 - 4.6 m Ω
- Which of the following expressions give the relationship between the acceleration due to gravity at the earth's surface g and the universal constant of gravitation G ?
 - $g = \frac{GM}{2R}$
 - $g = \frac{GMm}{R}$
 - $g = \frac{GMm}{R^2}$
 - $g = \frac{GM}{R^2}$
- The number of protons in an element increased by one after a radioactive decay. The element must have decayed by emitting
 - a gamma ray
 - a beta particle
 - an alpha particle
 - a neutron

ANSWERS TO PHYSICS 2014/2015 (SESSION 2)

1. A 2. A 3. A 4. A 5. C 6. A 7. C 8. A 9. D

10. B

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CHEMISTRY 2014/2015 QUESTIONS [SESSION 1]

1. A mixture of sand, ammonium chloride and sodium chloride is best separated by to
 A. sublimation followed by addition of water and filtration
 B. sublimation followed by addition of water and evaporation
 C. addition of water followed by filtration and sublimation
 D. addition of water followed by crystallization and sublimation

2. Which of the following elements is common to bronze and soft solder?
 A. tin
 B. lead
 C. copper
 D. zinc

3. A solution of calcium bromide contains 20g/dm^3 . What is the molar concentration of calcium bromide relative to bromide ions? [Ca = 40, Br = 80]
 A. 0.1, 0.1
 B. 0.1, 0.2
 C. 0.1, 0.05
 D. 0.05, 0.1

4. Haze is an example of
 A. colloid
 B. suspension
 C. emulsion
 D. aerosol

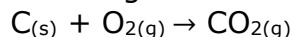
5. The volume of $0.20\text{ mol dm}^{-3}\text{ H}_2\text{SO}_4$ that will exactly neutralize 25 cm^3 of $0.05\text{ mol dm}^{-3}\text{ KOH}$ solution is
 A. 3.1 cm^3
 B. 10.4 cm^3
 C. 15.6 cm^3
 D. 26.2 cm^3

6. If the relative rate of diffusion of a gas is 0.25 and that of Cl_2 under the same condition is 0.20; calculate the relative molecular mass of the gas.
 A. 22.7
 B. 45.4
 C. 68.1
 D. 90.8

7. The oxidation states of Chlorine in HOCl_3 , HClO_3 , HClO_4 respectively are
 A. -1, +5 and +7

B. -1, -5 and +7
 C. +1, +3 and +4
 D. +1, +5 and +7

8. What is the sign of ΔH and ΔS in the following reaction?



$\Delta H \Delta S$
 A. + 0
 B. - +
 C. + -
 D. - 0

9. In the periodic table, what is the property that decreases along the period and increases down the group?

A. atomic number
 B. electron affinity
 C. ionization potential
 D. atomic radius

10. Rusting of iron is a

A. Redox reaction
 B. Decomposition reaction
 C. Catalytic reaction
 D. Reversible reaction

ANSWERS TO CHEMISTRY 2014/2015 (SESSION 1)

1. D 2. A 3. C 4. B 5. A 6. D 7. D 8. D 9. D

10. A

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CHEMISTRY 2014/2015 QUESTIONS [SESSION 2]

- Hydration of ions in solution is associated with
 - absorption of heat
 - reduction of heat
 - conduction of heat
 - liberation of heat
- A current was passed for 10 mins 20secs and 0.1 mole of Cu was deposited. How many grams of silver will be deposited by the same quantity of electricity? ($A_g=108$)
 - 10.8 g
 - 21.6 g
 - 5.4 g
 - 108 g
- What is the pH of 0.001mol dm^{-3} of H_2SO_4
 - 3
 - 2.7
 - 2
 - 4
- If a reaction is exothermic and there is a great disorder, it means
 - the reaction is in a state of equilibrium
 - there will be a large decrease in free energy
 - there will be a large increase in free energy
 - the reaction is static
- The gasification of coke is used for the manufacture of
 - natural gas
 - producer gas
 - synthetic gas
 - industrial gas
- Which of the following is arranged in order of increasing atomic radius?
 - Cl, P, Al, Mg, Na, Si
 - Na, Mg, Al, Si, P, Cl
 - Cl, P, Si, Al, Mg, Na
 - Na, Al, Si, Mg, P, Cl
- Calculate the molecular formula of a hydrocarbon with molar mass 26 and 92.3% of Carbon.
 - C_2H_2
 - C_3H_3
 - C_2H_6
 - C_2H_4

- Which of these can be used in removing oil stains?
 - Benzene.
 - Chlorine water
 - Washing soda/soda ash
 - potassium trioxonitrate V
- The position of equilibrium in a reversible reaction is affected by
 - surface area of the reactants exposed
 - presence of catalyst
 - changes in size of reaction flask
 - changes in concentration of the reaction
- Which of the following solutions containing only hydroxyl ions will liberate, hydrogen gas when reacted with magnesium metal?
 - $1.0 \times 10^{-12} \text{mol dm}^{-3}$
 - $1.0 \times 10^{-6} \text{mol dm}^{-3}$
 - $1.0 \times 10^{-4} \text{mol dm}^{-3}$
 - $1.0 \times 10^{-2} \text{mol dm}^{-3}$

ANSWERS TO CHEMISTRY 2014/2015 (SESSION 2)

1. D 2. B 3. A 4. B 5. C 6. C 7. A 8. A 9. D
10. A

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USE OF ENGLISH 2015/2016 QUESTIONS

Computer Based test (CBT)

In Questions 1- 3 choose the option NEAREST IN MEANING to the word in *italics*.

1. Ugo has often been described as *belligerent*.
A. attractive
B. combative
C. innocent
D. patient
2. Mohammed does his work with so much *ardour*
A. enthusiasm
B. discouragement
C. knowledge
D. indifference
3. The policy has been *espoused* by the ruling party
A. rejected
B. outlined
C. supported
D. condemned

In each of questions 4 to 5, fill each gap with the most appropriate option from the list provided.

4. I am sure that my mother will not find out. She is so _____, that she will accept anything I tell her.
A. credible
B. credulous
C. creditable
D. incredible
E. incredulous
5. My father told me to take the money from _____ it.
A. whoever offers
B. whomever offers
C. ever who offers
D. whomsoever offer

Reference Text:

Read the passage below carefully and answer the question that follows.

One day, Alan, a friend of mine, who likes country life, was fishing in a river, when he caught a trout. He tried to pull the fish in but

it slipped off the hook, flew over his head and landed in a field behind him.

Alan put down his rod, went through the gate and started searching for his trout. Some people, obviously from the city, were having a picnic in the field. One of the men shouted 'What on earth are you doing?' Thinking that it was a stupid question because they could see how he was dressed, Alan replied 'Fishing'.

'Don't be silly, the fish are down in the river', answered the man. 'Fish don't live in fields!' He turned to his friends, laughing, thinking that he' had made a good joke.

"Oh, but they do", said Alan. 'They jump out of the river to look for flies and I catch them with my hands. 'At that moment he 'found his trout in the grass and picked it up and showed it to the picnickers. He put it in his basket and bent down, as if he was hunting for another one. The picnickers, no longer laughing, spent the rest of the day searching the field.

6. The picnickers were
A. farmers
B. from the nearby village
C. tourists
D. people from the city
E. anglers like him

In each of questions 7 to 8, select the option that best explains the information conveyed in the sentence.

7. The convict said he was tired of leading a dog's life. To lead a dog's life means to live
A. carelessly
B. in disgrace
C. in solitude
D. in misery
E. in poverty
8. The President stood his ground because the Committee members would not be persuaded to arrive at a compromise on the issue being debated.
A. yielded his position
B. shifted his position
C. maintained his position

- D. defended his position
E. resisted his position

In questions 39 and 40 select the word OPPOSITE IN MEANING to that underlined.

9. The plebs can be found in every society of the world.
A. masses
B. elite
C. middle class
D. politicians
10. Oche entered the principal's office in a rather abrasive manner.
A. gentle
B. lackadaisical
C. rude
D. indifferent

Reference Text:

Read the passage below carefully and answer the question that follows.

In 1973 a Japanese Sericulturist arrived in Malawi with a batch of 40,000 silkworm eggs. They were taken to the Bvumbwe Agricultural Research Station in Thyolo District. In this station, work is being done to determine favourable silkworm rearing conditions and areas where mulberry trees, whose leaves the worms feed on, could grow well. According to researchers, the silkworms which eventually develop into cocoons from which raw silk is produced do well in areas with warm climatic conditions.

Silk is one of the strongest of fibres. In fact, for thousands of years, silk fabrics have been regarded as the most beautiful and durable materials woven by man. Many people call silk the 'cloth of kings and queens'.

The weaving of silk originated in China. An old Chinese book, believed to be written by Confucius, tells us that the wife of Emperor Huang-ti was the first person to make fabrics of silk. Around 2640 B.C., Emperor Huang-ti asked his wife Hsi Lingshih to study the worms that were destroying the mulberry trees in his garden. The Empress took some of the cocoons into the palace to see what they were made of. She dropped one of the cocoons into a bowl of boiling water and was amazed to see a cobweb-like tangle separate itself from the cocoon.

She picked up the gauzy mass and found that one of the threads could be unwound almost without end from the cocoon. His Linu-shih had discovered silk. She was delighted with the discovery and even wove a ceremonial robe for the Emperor out of the cocoon thread. After that, the officials in the Emperor's court wore brightly dyed silk robes on important occasions:

People in other countries regarded the new fibres as something rare and beautiful. A few traders went to China to learn about making cloth from silk, but the Chinese kept their silk worms a closely guarded secret.

11. It is implied in this passage that silk was discovered
A. after years of hard work and research by the Empress.
B. by accident.
C. in the search for a more durable fibre for making cloth.
D. after some experiments carried out by the Japanese sericulturist.
E. by design.

Question 12 is based on Jerry Agada's The Successors

12. What did Terkura Asten do with the remaining money chief Ofege gave to him? He _____
A. bought a beautiful house.
B. bought two cars for his father.
C. married another wife.
D. invested in his business.

In question 13, choose the option that has the same consonant sound as the one represented by the letter(s) underlined.

13. Vision
A. mansion
B. enclosure
C. nation
D. capture

In the following question, choose the appropriate stress pattern from the options, the syllables are written in capital letters.

14. information
A. inforMAtion
B. INformation
C. inFORmation

D. informaTION

In question 15, the word in capital letters has an emphatic stress. Choose the option that best fits the expression in the sentence.

15. The traditional chief NARRATED the stop to the children.

- A. The children heard the story from the traditional chief
- B. Who narrated the story to the children?
- C. The children could not listen to the story by the traditional chief.
- D. Did the chief hide the story from the children?

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USE OF ENGLISH 2015/2016 ANSWERS

1. B 2. A 3. C 4. B 5. A 6. D 7. D 8. C 9. B
10. A 11. B 12. D 13. B 14. A 15. D

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MATHEMATICS 2015/2016 QUESTIONS

- The integral values of y which satisfy the inequality $-1 < 5 - 2y \leq 7$ are
 A. -1, 0, 1, 2
 B. 0, 1, 2, 3
 C. -1, 0, 1, 2, 3
 D. -1, 0, 2, 3
- A regular polygon with $(2m + 1)$ sides has each interior angle equal to 144° . The value of m is
 A. $4\frac{1}{2}$
 B. 5
 C. 8
 D. 10
- An observer standing on the top of a building 40m high views a stone on the ground level at an angle of depression of 38° . The distance of the stone from the foot of the building, in metres, is equal to
 A. $40 \sin 38^\circ$
 B. $40 \cos 38^\circ$
 C. $40 \cot 38^\circ$
 D. $40 \tan 38^\circ$
- If the mass of a solid metal sphere of radius 3 cm is 9 kg, the mass of a spherical shell of the same metal whose internal and external radii are 2 cm and 3 cm respectively is
 A. $4\frac{1}{2}$ kg
 B. 6 kg
 C. $6\frac{1}{3}$ kg
 D. $7\frac{1}{2}$ kg
- X is a variable point which is equidistant from two parallel lines PQ and RS of equal lengths such that $PQRS$ forms a rectangle. If $\angle XPQ = 25^\circ$, then $\angle RRS$ is
 A. 130°
 B. 65°
 C. 50°
 D. 25°
- The average age of the three children in a family is 9 years. If the average age of their parents is 39 years, the average age of the whole family is
 A. 20 years
 B. 21 years
 C. 24 years
 D. 27 years

- A photograph is to be taken of five people including a married couple. If the married couple insist on sitting next to each other, the number of different arrangements is
 A. 20
 B. 24
 C. 48
 D. 60
- The binary operations \odot and \otimes are defined over the set of real numbers by $a \odot b = ab - b - 1$ and $a \otimes b = ab + b - 2$. Find the value of $3 \otimes (4 \odot 5)$.
 A. 42
 B. 54
 C. 57
 D. 60
- A pump P can fill a water tank in 5h. With a second pump Q also operating, the tank can be filled in 2 h. Pump Q operating alone can fill the tank in
 A. 3 h
 B. $3\frac{1}{3}$ h
 C. $3\frac{1}{2}$ h
 D. 4 h
- If $x - 1, x, x + 2$ form a geometric sequence, then the value of x is
 A. 1
 B. -1
 C. 2
 D. -2

ANSWERS TO MATHEMATICS 2015/2016

1. A 2. A 3. C 4. C 5. A 6. B 7. C 8. B 9. B
 10. C

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PHYSICS 2015/2016 QUESTIONS [SESSION 1]**Computer Based Test (CBT)**

1. From the kinetic theory of gases, temperature is a

- A. form of energy and is proportional to the total kinetic energy of the molecules.
- B. form of energy and is proportional to the average kinetic energy of the molecules.
- C. physical property and is proportional to the total kinetic energy of the molecules.
- D. physical property and is proportional to the average kinetic energy of the molecules.

2. A 20-toothed gear wheel drives a 60-toothed one. If the angular speed of the smaller wheel is 120 rev s^{-1} the angular speed of the larger wheel is _____

- A. 3 rev s^{-1}
- B. 40 rev s^{-1}
- C. 360 rev s^{-1}
- D. 2400 rev^{-1}

3. The speed of sound in air at sea-level is 340 ms^{-1} , while that of light is 300000 km^{-1} . How far (to the nearest meter) from the centre of a thunderstorm is an observer who hears a thunder 2s after a lightening flash?

- A. 170 m
- B. 340 m
- C. 600 m
- D. 680 m

4. A cell of internal resistance 2 ohms supplies current to a -6-ohm resistor. The efficiency of the cell is _____

- A. 12.0%
- B. 25.0%
- C. 33.3%
- D. 75.0%.

5. The length of a side of metallic cube at 20°C is 5.0 cm. Given that the linear expansivity of the metal is $4.0 \times 10^{-5}\text{k}^{-1}$. Find the volume of the cube at 120°C .

- A. 126.50 cm^3
- B. 126.25 cm^3
- C. 126.00 cm^3
- D. 125.00 cm^3

6. As a result of air at the top of a barometer, the height of the mercury column is 73.5 cm when it should be 75.0 cm; the volume of the space above the mercury is 8.0 cm^3 . Calculate the correct barometric

height when the barometer reads 74.0 cm and the volume of the space above the mercury is 6.0 cm^3 .

- A. 72.0 cm
- B. 74.5 cm
- C. 75.1 cm
- D. 76.0 cm

7. A wave has a frequency of 2 Hz and a wavelength of 30 cm. The velocity of the wave is _____

- A. 60.0 ms^{-1}
- B. 6.0 ms^{-1}
- C. 1.5 ms^{-1}
- D. 0.6 ms^{-1}

8. If the distance between two stationary charged particles is doubled, the magnitude of the electrostatic force between them will be _____

- A. Doubled
- B. Halved
- C. A quarter of its former value
- D. Unchanged
- E. Four times the original value

9. Which of the following methods CANNOT be used to produce a steel magnet?

- The _____
- A. passing of an electric current through a solenoid
 - B. repeated stroking of the specimen with a magnet
 - C. repeated stroking of the specimen in opposite directions with two magnets
 - D. heating of the specimen.
 - E. hammering of the specimen in the earth's magnetic fields

10. Of the following derived units, the one that is not a unit of power is _____

- A. joule/second
- B. ampere volt
- C. ampere² ohm
- D. ohm²/volt
- E. volts²/ohm

11. Which of the following may be used to determine the relative humidity in a physics laboratory?

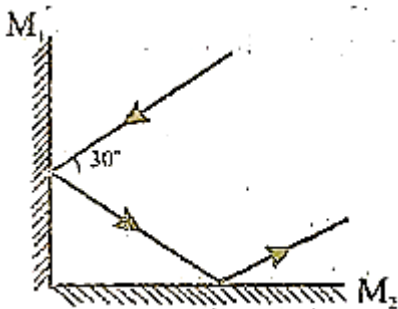
- I. Manometer
- II. Wet and dry bulb hygrometer
- III. Hair Hygrometer
- IV. Hydrometer

- A. 1 only
- B. II and III only
- C. II only
- D. III only
- E. II, III and IV only

12. A machine has a velocity ratio of 5. It requires a 50kg weight to overcome a 200kg weight. The efficiency is _____

- A. 4%
- B. 5%
- C. 40%
- D. 50%
- E. 80

13.



Two mirrors M_1 and M_2 are inclined at right angles as shown above. Calculate the angle of reflection of the ray of light at mirror M_2 .

- A. 30°
- B. 45°
- C. 60°
- D. 90°

14. When an atom loses or gains a charge, it becomes _____

- A. an electron
- B. an ion
- C. a neutron
- D. a proton

15. A tap supplies water at 25°C while another supplies water at 75°C . If a man wishes to bathe with water at 40°C , the ratio of the mass of cold water to the mass of hot water required is _____

- A. 1:3
- B. 15:8
- C. 7:3
- D. 3:1

ANSWERS TO PHYSICS 2015/2016 QUESTIONS [SESSION 1]

1. D 2. B 3. D 4. D 5. A 6. D 7. D 8. C 9. D

10. D 11. B 12. E 13. C 14. B 15. C

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PHYSICS 2015/2016 QUESTIONS [SESSION 2]**COMPUTER BASED TEST**

1. An object is placed 10cm, in front of a concave mirror of focal length 15cm. What is the position and nature of the image formed?

- A. 30cm and virtual
- B. 6cm and real
- C. 6cm and virtual
- D. 30cm and real

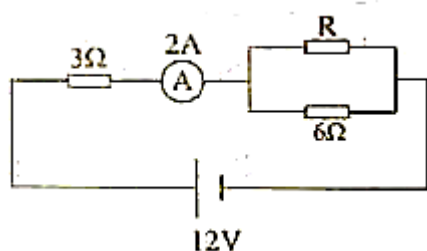
2. When the tension of a sonometer wire is doubled, the ratio of the new frequency to the initial frequency is _____

- A. $\frac{1}{\sqrt{2}}$
- B. $\frac{1}{2}$
- C. $\sqrt{2}$
- D. 2

3. A short response time is obtained in a liquid-in-glass thermometer when the _____

- A. stem is long and thin
- B. bulb is large and thick-walled
- C. bulb is small and thick-walled
- D. liquid is of high density and the bore is large
- E. bulb is thin-walled and the liquid is a good conductor of heat

4.



In the figure above, the value of R is _____

- A. 3Ω
- B. 4Ω
- C. 5Ω
- D. 6Ω

5. I. The frictional force is independent of the area of the surfaces in contact.

II. The frictional force depends on the nature of the surfaces in contact.

III. The frictional force depends on the speed of the sliding.

IV. The frictional force is directly proportional to the normal reaction.

Which combination of the above is true of sliding friction?

- A. I, II and IV
- B. I, II and III
- C. I, III and IV
- D. II, III and IV

6. The electrochemical equivalent of a metal is $0.126 \times 10^{-6} \text{kg/C}$. The mass of the metal that a current of 5A will deposit from a suitable bath in 1 hour is _____

- A. $0.0378 \times 10^{-3} \text{kg}$
- B. $0.227 \times 10^{-3} \text{kg}$
- C. $0.378 \times 10^{-3} \text{kg}$
- D. $2.268 \times 10^{-3} \text{kg}$

7. Which of the following is in a neutral equilibrium.

- A. A heavy weight suspended on a string.
- B. A cone resting on its slant edge.
- C. A heavy-based table lamp.
- D. The beam of a balance in use.

8. Which of the following instruments has a pure tone?

- A. Guitar
- B. Vibrating string
- C. Tuning fork
- D. Siren

9. If a radioactive substance with a half-life of 3 minutes remains 400g after 6 minutes, what is the original mass of the substance?

- A. 800g
- B. 2400g
- C. 600g
- D. 1600g

10. An object placed 36cm from a converging lens of focal length 20cm forms a real image which is 40cm high. What is the height of the object?

- A. 30cm
- B. 22cm
- C. 32cm
- D. 45cm

11. Which of the following statements about defects of vision is/are CORRECT?

- I. For a long-sighted person, close objects appear blurred.
- II. For a short-sighted person, distant objects appear blurred.

III. Short sight is corrected by using a pair of converging lenses.

- A. I and II only
- B. II only
- C. I only
- D. II and III only

12. The total length of a spring when a mass of 20g is hung from its end is 14cm, while its total length is 16cm when a mass of 30g is hung from the same end. Calculate the unstretched length of the spring assuming Hooke's law is obeyed.

- A. 9.33 cm
- B. 12.00cm
- C 10.00cm
- D. 10.66cm

13. A milliammeter with full scale deflection of 10mA has an internal resistance of 5 ohms. It would be converted to an ammeter with a full-scale deflection of 1A by connecting a resistance of _____

- A. 99/5 ohm in series with it
- B. 99/5 ohm in parallel with it
- C. 5/99 ohm in parallel with it
- D. 5/99 ohm in series with it

14. What precaution should a manufacturer take to ensure that energy loss in a transformer is minimized?

- A. The winding of the transformer should be made of high resistance wires.
- B. The core should be made of thin sheets of metal.
- C. No magnetic material should be used to make the core.
- D. The flux linking the primary with the secondary coils should be minimum

15. If an object is placed in front of two mirrors inclined at 90° , how many images will be formed?

- A. Five
- B. Four.
- C. Three
- D. Two

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PHYSICS 2015/2016 ANSWERS [SESSION 2]

1. A 2. A 3. E 4. D 5. A 6. D 7. B 8. C 9. D

10. C 11. A 12. C 13. C 14. B 15. C

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CHEMISTRY 2015/2016 QUESTIONS [SESSION 1]**COMPUTER BASED TEST(CBT)**

1. $2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g}) \Delta H = -395.7 \text{KJmol}^{-1}$
the reaction above, the concentration of $\text{SO}_3(\text{g})$ can be increased by

- A. decreasing the pressure
- B. decreasing the temperature
- C. increasing the temperature
- D. the addition of catalyst

2. Which of the following compounds is a normal salt?

- A. Na_2CO_3
- B. NaHSO_4
- C. NaHCO_3
- D. NaHS

3. Which of the following ions can be used as an oxidizing agent?

- A. F^-
- B. Fe^{3+}
- C. Au^{3+}
- D. Ca^{2+}

4. $\text{CO}(\text{g}) + \text{H}_2\text{O}(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2(\text{g})$

Calculate the standard heat change of the reaction above if the standard enthalpies of formation of $\text{CO}_2(\text{g})$, $\text{H}_2\text{O}(\text{g})$ and $\text{CO}(\text{g})$ in KJmol^{-1} are -394, -242 and -110 respectively.

- A. +262 KJ mol^{-1}
- B. -262 KJ mol^{-1}
- C. +42 KJ mol^{-1}
- D. -42 KJ mol^{-1}

5. $\text{CH}_3\text{CH}_2\text{Cl} + \text{KCN} \rightarrow \text{CH}_3\text{CH}_2\text{CN} + \text{KCl}$

In the reaction above, the cyanide is

- A. nucleophilic
- B. electrophilic
- C. hydrophilic
- D. hydrophobic

6. The bleaching action of chlorine gas is effective due to the presence of

- A. oxygen
- B. hydrogen chloride
- C. water
- C. air

7. Which of the following pairs of substances will wet further with oxygen to form a higher oxide?

- A. SO_2 and NO
- B. CO_2 and H_2O
- C. CO and CO_2

D. NO and H_2O

8. The salt formed between citric acid and sodium hydroxide in solution will be

- A. acidic
- B. neutral
- C. basic
- D. amphoteric

9. On exposure to the atmosphere, a hydrated salt loses its water of crystallization to become anhydrous. This phenomenon is referred to as

- A. deliquescent
- B. hygroscopy
- C. hydrolysis
- D. efflorescence

10. Vulcanization involves the removal of

- A. a double bond
- B. the single bond
- C. a polymer
- D. a monomer

11. In an equilibrium reaction, which of the following conditions indicates that maximum yield of product will be obtained?

- A. Equilibrium constant is very large
- B. $\Delta H - T\Delta S = 0$
- C. $\Delta H > T\Delta S$
- D. Equilibrium constant is less than zero

12. $2\text{C}_2\text{H}_2(\text{g}) + 5\text{O}_2(\text{g}) \rightarrow 4\text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{g})$

In the reaction above, the mass or carbon(IV) oxide produced by burning 78g of ethyne is

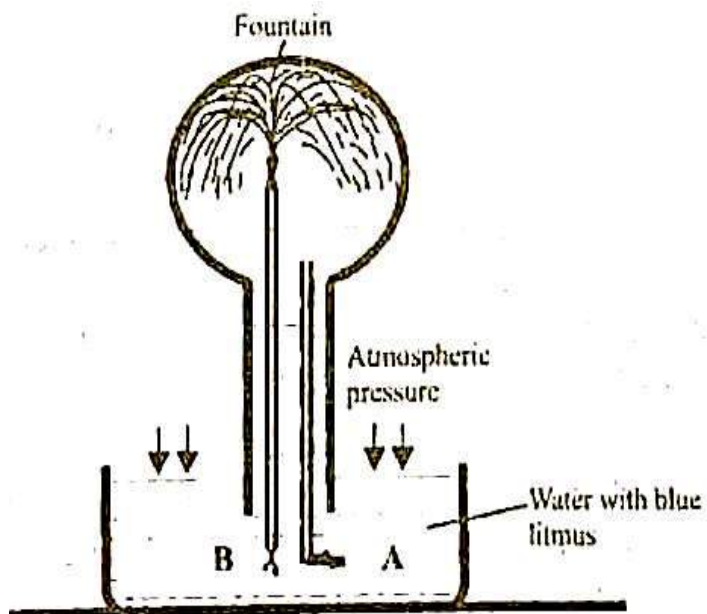
- A. 264g
- C. 352g
- B. 39g
- D. 156g

13. $\text{Cu}_{(\text{aq})}^{2+} + 4\text{NH}_3(\text{g}) \rightleftharpoons [\text{Cu}(\text{NH}_3)_4]_{(\text{aq})}^{2+}$

In the reaction above, what is the effect of precipitating $\text{Cu}_{(\text{aq})}^{2+}$ as $\text{CuS}(\text{s})$

- A. $\text{NH}_3(\text{g})$ concentration will decrease
- B. More $\text{NH}_3(\text{g})$ will be generated
- C The equilibrium will shift to the right
- D. There will be no effect

Use the diagram below to answer questions 14 and 15



14. Which of the following gases can be used to demonstrate the experiment?

- A. hydrogen chloride
- B. hydrogen sulphide
- C. nitrogen(II) oxide
- D. dinitrogen(I) oxide

15. The colour of the fountain water is

- A. orange
- B. blue
- C. red
- D. yellow

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ANSWERS TO CHEMISTRY 2015/2016 (SESSION 1)

1. B 2. A 3. D 4. D 5. A 6. C 7. A 8. C 9. D

10. A 11. A 12. A 13. B 14. A 15. C

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CHEMISTRY 2015/2016 QUESTIONS [SESSION 2]**COMPUTER BASED TEST (CBT)**

1. The basicity of CH_3COOH is

- A. 1
- B. 2
- C. 3
- D. 4

2. Ethanol reacts with concentrated tetraoxosulphate (VI) acid at a temperature above 170°C to form

- A. ethanone
- B. ethanal
- C. ethyne
- D. ethene

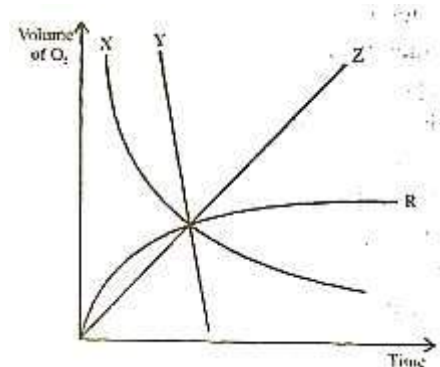
3. The type of bonding in iodine molecule is

- A. dative
- B. covalent
- C. coordinate
- D. electrovalent

4. The acid used in electrolysis of water is

- A. HNO_3
- B. CH_3COOH
- C. H_2SO_4
- D. HCl

5.



In the diagram above, which of the curves represents the evolution of oxygen with time in the equation



- A. X
- B. Y
- C. Z
- D. R

6. In the laboratory preparation of oxygen, dried oxygen is usually it is collected over

- A. mercury
- B. calcium chloride
- C. tetraoxosulphate(VI) acid

D. hydrochloric acid

7. The elements that belong to the third period, of the periodic table are

- A. Li, Be, Al and P
- B. Na, P, O and Cl
- C. B, C, N and O
- D. Na, Mg, S and Ar

8. Synthetic gas is a mixture of

- A. CH_4 and H_2O
- B. CH_4 and H_2
- C. CO_2 and H_2
- D. CO and H_2

9. Which of the following is a neutralization reaction? The addition of

- A. nitric acid to hydrochloric acid
- B. nitric acid to distilled water
- C. nitric acid to sodium hydroxide
- D. sodium hydroxide to distilled water

10. A metal X forms two bromides with formulae XBr_2 and XBr_3 . What type of bonding exists, between X and bromine in the bromides?

- A. Metallic bonding
- B. Ionic bonding
- C. Covalent bonding
- D. Dative bonding

11. Calculate the mass of 1.12 dm^3 of chlorine gas.

- A. 3.55g
- B. 35.5g
- C. 4.5g
- D. 1.78g

12. The sulphide which is insoluble in dilute hydrochloric acid is

- A. ZnS
- b. Na_2S
- C. FeS
- D. CuS

13. What is the pH of a $0.001 \text{ mol dm}^{-3}$ solution of sodium hydroxide?

- A. 14
- B. 13
- C. 12
- D. 11

14. The type of isomerism shown by cis- and trans-isomers is

- A. optical isomerism
- B. positional isomerism
- C. functional isomerism
- D. geometrical isomerism

15. Which of the following statements is true about 2-methylpropane and butane?

- A. They have the same boiling points
- B. They have different number of carbon atoms
- C. They have the same chemical properties
- D. They are members of the same homologous series

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CHEMISTRY 2015/2016 ANSWERS (SESSION 2)

1. A 2. D 3. B 4. C 5. D 6. A 7. D 8. D 9. C

10. B 11. A 12. D 13. D 14. D 15. D

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USE OF ENGLISH 2017/2018 QUESTIONS

QUESTIONS (CBT)

In the questions 1 to 8, choose the expression or word which best completes each sentence.

- Many African leaders cling _____ to power.
 - economically
 - judiciously
 - tenaciously
 - furiously
- Most newspapers help the _____ public.
 - reading
 - reader
 - reader's
 - readable
- After the initial confusion, the Manager's suggestion brought _____ to the depressed investors.
 - a glitter of hope
 - a sparkle of hope
 - a raise of hope
 - a glimmer of hope
- This is the very man about _____ our teacher spoke during the session.
 - whose
 - whom
 - who
 - which
- The problems of-Nigeria's worsening economy seem to have _____ an immediate solution.
 - rejected
 - defiled
 - defied
 - defined
- He is very tired. He really _____ is staying up late.
 - getting used to
 - got used to
 - used to
 - not used to
- The body is sensitive to changes in velocity which, if too sudden, _____.
 - it may lose consciousness
 - consciousness may be lost
 - one may become unconscious

D. may cause loss of consciousness

8. The situation has deteriorated sharply and relatives between the two countries may soon be _____.

- removed
- broken
- eliminated
- withdrawn

In each of questions 9 to 10, select the option that best expresses the meaning of the phrase or word underlined

9. After a careful review of Adamu's last examination result, the principal concluded that his performance left much to be desired.

- was extremely desirable
- was very brilliant
- was very unsatisfactory
- was very satisfactory

10. The take home pay of many workers is such that they can hardly make both ends meet.

- finish their schedule of work
- live an honest life
- keep two jobs at a time
- live within their income

In questions 11 and 12, select the option that expresses the same idea as the one in quotes

11. "To put something aside" is to

- keep in safety
- keep something for some special purpose
- put it in a side pocket for future use
- put it by one's side

12 "An open secret" means

- an open matter
- a fact that is very secret
- a secret known to everybody
- a confidential matter

In each of questions 13 and 14, choose the option nearest in meaning to the words in italics.

13. *Most people are vulnerable to communicable disease.*

- exposed
- liable

- C. open
- D. immutable

14. The recent meeting of the two rebel leaders was a *propitious* moment for stable government in the country.

- A. delicate
- B. auspicious
- C. important
- D. outstanding

15. Which of the following options has stress on the first syllable?

- A. Madam
- B. Command
- C. Invite
- D. Prepare

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ANSWERS TO 2017/2018 USE OF ENGLISH

1. C 2. A 3. D 4. B 6. D 7. D 8. B 9. C 11. B
12. C 13. C 14. B 15. A

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MATHEMATICS 2017/2018 QUESTIONS

COMPUTER BASED TEST (CBT)

1. Calculate the perimeter of the segment of a circle of radius 7cm if the chord subtends angle 90° at the centre.

- A. $7\sqrt{2}$ cm
- B. 11 cm
- C. $(11+7\sqrt{2})$ cm
- D. $(11-7\sqrt{2})$ cm

2. The ratio of the sides of two similar rectangular blocks is 5:3. If the volume of smaller block is 324 cm^3 , that of the other block is

- A. 1500 cm^3
- B. 900 cm^3
- C. 864 cm^3
- D. 540 cm^3

3. From an observation point close the edge the sea, a ship is 14 km away on a bearing of 130° . A second ship is 48 km away on a bearing of 220° . This distance separating the ships is

- A. 32 km
- B. 50 km
- C. 55 km
- D. 62 km

4. The average age of the three children, in a family is 9 years. If the average age of their parents is 39 years, the average age of the whole family is

- A. 20 years
- B. 21 years
- C. 24 years
- D. 27 years

5. How many different three-digit number can be formed using the integers 1 to 6 if no integer occurs twice in a number?

- A. 20
- B. 60
- C. 120
- D. 240

6. The rate of ice formation in the freezer compartment of a refrigerator is $(2 - 0.3t)$ g per min; where t is the time in minutes. If there was initially 10 g of ice in the ice-maker, the mass of ice present after 10 minutes is

- A. 5 g
- B. 10 g

- C. 15 g
- D. 25 g

7. A die is thrown and a coin is tossed. Find the probability that the die shows an even number and the coin shows a head.

- A. $\frac{1}{4}$
- B. $\frac{1}{6}$
- C. $\frac{1}{2}$
- D. 1

8. If two triangles are similar, then

- I. the corresponding angles are equal
 - II. the corresponding sides are proportional
 - III. the areas of the triangles are in the same ratio as the lengths of the corresponding sides
 - IV. the triangles are congruent
- Which of the above statements are CORRECT?

- A. I and II only
- B. III and IV only
- C. I, II and III only
- D. I, III and IV only

9. A binary operation $*$ is defined over the set of real numbers such that $m * n = m + n + 2$ and $m \odot n = m - n + 1$. Which of the following equations is not true?

- A. $a*(b*c) = (a*b)*c$
- B. $a*(b*c) = (a*c) * b$
- C. $a \odot (b \odot c) = (a \odot b) \odot c$
- D. $a*(b \odot c) = (a*b) \odot c$

10. If $2\cos 2\theta = -\cos \theta$ and $0 < \theta < 180^\circ$, then θ is

- A. 90° or 120°
- B. 60° or 90°
- C. 60° or 120°
- D. 30° or 150°

11. The coordinates of the vertices P and Q of a square PQRS are $P = (1, 3)$ and $Q = (5, 1)$. The coordinates of R could be

- A. (3, 7)
- B. (3, 0)
- C. (6, 3)
- D. (7, 5)

12. When a polynomial $f(x)$ is divided by $2x - 3$, the quotient is $x^2 - x + 2$ and the remainder is -1 . Find $f(x)$.

- A. $2x^3 - 5x^2 + 7x - 5$
- B. $2x^3 - 5x^2 + 7x - 7$
- C. $2x^3 + 5x^2 - 3x + 7$
- D. $2x^3 - 5x^2 - 7x + 5$

13. Divide 2434_6 by 42_6

- A. 23_6
- B. 35_6
- C. 52_6
- D. 55_6

14. What are the integral values of x which satisfy the inequality $-1 < 3 - 2x \leq 5$?

- A. $-2, 1, 0, -1$
- B. $-1, 0, 1, 2$
- C. $-1, 0, 1$
- D. $0, 1, 2$

15. If $6\log_x 2 - 3\log_x 3 = 3\log_5 0.2$, find x

- A. $\frac{3}{8}$
- B. $\frac{3}{4}$
- C. $\frac{4}{3}$
- D. $\frac{8}{3}$

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ANSWERS TO MATHEMATICS 2017/2018

1. C 2. A 3. B 4. B 5. C 6. C 7. A 8. A 9. C

10. A

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PHYSICS 2017/2018 QUESTIONS [SESSION 1]**COMPUTER BASED TEST**

1. The force on a current carrying conductor in a magnetic field is greatest when the
A. conductor makes an angle of 60° with the field

B. Force is independent of the angle between the field and the conductor
C. conductor is parallel with the field

D. conductor is at right angles with the field

2. A moving Coil galvanometer of $300\ \Omega$ resistance gives full scale deflection for 1.0mA . The resistance, R , of the shunt that is required to convert the galvanometer into a 3.0A ammeter is

A. $899.70\ \Omega$

B. $10.00\ \Omega$

C. $0.10\ \Omega$

D. $0.01\ \Omega$

3. The range of wavelengths of the visible spectrum is 400nm to 700nm . The wavelength of gamma rays is

A. shorter than 700nm but longer than 400nm

B. longer than 700nm

C. shorter than 400nm

D. 550nm

4. If the relative density of a metal is 19, what will be the mass of 20cm^3 of the metal when immersed in water?

A. 400g

B. 39g

C. 380g

D. 360g

5. Vapour is said to be saturated when

A. more molecules return to the liquid than the amount that left it

B. a dynamic equilibrium exists between the molecules of the liquid and the vapour molecules at a given temperature

C. the vapour pressure is equal to the atmospheric pressure

D. all the molecules are moving with the same speed in all directions at a given temperature

6. When a transformer has more secondary windings than primary windings; it

A. has a smaller secondary current.

B. has a greater power output.

C. is a stepdown transformer.

D. increases the total energy output.

7. When light is incident on an object which is magenta in colour, which of the following colours would be absorbed?

A. Red and blue

B. Green only

C. Cited and green

D. Red only

8. Which of the following statements about friction is NOT correct?

A. The force of kinetic friction is less than the force of static friction.

B. The force of kinetic friction between two surfaces is independent of the areas in contact provided the normal reaction is unchanged.

C. The angle of friction is the angle between the normal reaction and the force friction.

D. The force of rolling friction between two surfaces is less than the force of sliding friction.

9. Electrical power is transmitted at a high voltage rather than low voltage because the amount of energy loss is 'due to _____.

A. heat dissipation

B. production of Eddy current

C. excessive current discharge

D. excessive voltage discharge

10. A ship traveling towards a cliff receives the echo of its whistle after 3.5 seconds. A short while later, it receives the echo after 2.5 seconds. If the speed of sound in air under the prevailing conditions is 250ms^{-1} , how much closer is the ship to the cliff?

A. 10m

B. 350m

C. 175m

D. 125m

11. A current-carrying conductor experiences a force when placed in a magnetic field because the

A. conductor is magnetised

B. magnetic field of the current interacts with external magnetic field

C. force is due to the motor principle

D. electric field of the current interacts with external magnetic field

12. The linear expansivity of brass is

$2 \times 10^{-5} \text{C}^{-1}$. If the volume of a piece of brass is 15.00cm^3 at 0°C , what is the volume at 100°C ?

- A. 16.03cm^3
- B. 16.00cm^3
- C. 15.09cm^3
- D. 15.03cm^3

13. In a resonance tube experiment, a tube of fixed length is closed at one end and several tuning forks of increasing frequency used to obtain resonance at the open end. If the tuning fork with the lowest frequency which gave resonance had a frequency f_1 and the next tuning fork to give resonance had a frequency f_2 find the ratio $f_2:f_1$

- A. $\frac{1}{2}$
- B. 3
- C. 9
- D. 8

14. I. Its velocity is constant.
II. No work is done on the body.
III. It has constant acceleration directed away from the centre.
IV. The centripetal force is directed towards the centre.

Which combination above is true of a body moving with constant speed in a circular track?

- A. I and III
- B. I and IV
- C. II and III
- D. II and IV

15. A machine requires 1000 J of work to raise a load of 500N through a vertical distance of 1.5m. Calculate the efficiency of the machine.

- A. 80%
- B. 75%
- C. 50%
- D. 33%

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ANSWERS TO PHYSICS 2017/2018 (SESSION 1)

1. D 2. C 3. C 4. C 5. B 6. A 7. B 8. C 9. A
10. D 11. B 12. C 13. B 14. D 15. B

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PHYSICS 2017/2018 QUESTIONS [SESSION 2]**COMPUTER BASED TEST (CBT)**

1. A 24V potential difference is applied across a parallel combination of four 6-ohm resistors. The current in each resistor is

- A. 1A
- B. 4A
- C. 16 A
- D. 18A
- E. 36A

2. In which of the following arrangements is the wavelength in an increasing order?

- A. Gamma rays, infrared rays, x-rays, radio waves.
- B. Gamma rays, x-rays, infrared rays, radio waves.
- C. Radio waves, x-rays, gamma rays, infrared rays.
- D. Infrared rays, radio waves, x-rays, gamma rays.

3. A galvanometer of resistance 20 is to be provided with a shunt such that $\frac{1}{10}$ of the whole current in a circuit pass through the galvanometer. The resistance of the shunt is

- A. 2.00
- B. 2.22
- C. 18.00
- D. 18.22

4. An inclined plane which makes an angle of 30° with horizontal has a velocity ratio of

- A. 2
- B. 1
- C. 0.866
- D. 0.50

5. A 20kg mass is to be pulled up in a slope inclined at 30° to the horizontal. if the efficiency of the plane is 75%, the force required to pull, the load, up the plane is.... ($g=10\text{m/s}^2$).

- A. 13.3N
- B. 73.5 N
- C. 133.3 N
- D. 533.2N

6. If a room is saturated with water vapour, the temperature of the room must be

- A. at 0°C .
- B. above the dew point
- C. at 100°C
- D. below or at the dew point

7. The refractive index of a liquid is 1.05. If the velocity of light in vacuum is $3.0 \times 10^8 \text{ ms}^{-1}$, the velocity of light in the liquid is _____.

- A. $1.5 \times 10^8 \text{ ms}^{-1}$
- B. $2.0 \times 10^8 \text{ ms}^{-1}$
- C. $3.0 \times 10^8 \text{ ms}^{-1}$
- D. $4.5 \times 10^8 \text{ ms}^{-1}$
- E. $9.0 \times 10^8 \text{ ms}^{-1}$

8. Which of the following quantities are scalars?

- I. Electrical potential
- II. Torque
- III. Momentum
- IV Kinetic energy

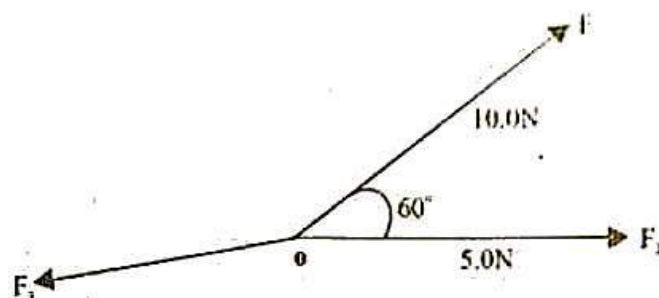
- A. II and III only
- B. II and IV only
- C. III and IV only
- D. I and IV only

9. A block of ice floats on water inside a container. If the block of ice gets completely melted, the level of water in the container will

- A. increase
- B. remain the same
- C. decrease
- D. first decrease and then increase

10. Thermal equilibrium between two objects exists when

- A. the temperatures of both objects are equal
- B. the quantity of heat in both objects is the same
- C. the heat capacities of both objects are the same
- D. one object loses heat continuously to the other



11. In the figure above, the three forces F_1 , F_2 , F_3 acting at O are in equilibrium. If the magnitude F_1 is 10.0N and the magnitude of F_2 is 5.0N, find the magnitude of F_3 .

- A. 26.4N
- B. 15.0N
- C. 13.2N
- D. 10.0N

12. 22,000J of heat is required to raise the temperature of 1.5kg of paraffin from 20°C to 30°C. Calculate the specific heat capacity of paraffin.

- A. 1466 J Kg⁻¹°C⁻¹
- B. 2933 J Kg⁻¹°C⁻¹
- C. 4400 J Kg⁻¹°C⁻¹
- D. 58661 J Kg⁻¹°C⁻¹

13. When white light is dispersed by a spectrometer, the component having the shortest wavelength is

- A. orange
- B. green
- C. violet
- D. red

14. An Object is placed 5.6×10^{-4} m in front of a converging lens of focal length 1.0×10^{-3} m. The image formed is

- A. real, erect and magnified
- B. virtual, erect and magnified
- C. real, inverted and magnified
- D. virtual, erect and diminished

15. A bar magnet is most effectively demagnetized by

- A. placing it in a N 5 position and hitting it with a hammer
- B. subjecting it to an electric current from a battery
- C. bringing its north pole in contact with the north pole of a very strong magnet
- D. heating the magnet

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PHYSICS 2017/2018 ANSWERS (SESSION 2)

1. B 2. B 3. B 4. A 5. C 6. D 7. B 8. D 9. B

10. A 11. C 12. A 13. C 14. B 15. D

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CHEMISTRY 2017/2018 QUESTIONS [SESSION 1]**Computer Based Test (CBT)**

1. Stainless steel is used for making

- A. Tools
- B. Magnets
- C. Coins and medals
- D. Moving parts of clock

2. The product formed at the cathode during the electrolysis of sodium chloride solution with carbon electrodes is

- A. sodium
- B. chlorine
- C. hydrogen
- D. oxygen

3. The alkanol obtained from the production of soap is

- A. ethanol
- B. glycerol
- C. propanol
- D. glycol

4. Some metals are extracted from their ores after some preliminary treatments by electrolysis (L), some by thermal reaction (T) and some by a combination of both processes (TL). Which set-up in the following for the extraction of iron, copper and aluminium is correct?

- A. iron (L), copper (L), aluminium (T)
- B. Iron (T), copper (L) aluminium (T)
- C. Iron (TL), copper (TL)aluminium (TL)
- D. Iron (L), copper (T). aluminium (T)
- E. Iron (T), copper (L), aluminium (TL)

5. Which of the following will liberate hydrogen from steam or dilute acid?

- A. Iron
- B. Mercury
- C. Copper
- D. Lead

6. The colour of methyl orange in alkaline medium is

- A. orange
- B. red
- C. yellow
- D. pink

7. A compound contains 40.0% carbon, 6.7% hydrogen and 53.3% oxygen. If the molar mass of the compound is 180, find the molecular formula.

- A. $C_6H_6O_3$
- B. $C_6H_{12}O_6$
- C. $C_3H_6O_3$
- D. CH_2O

8. Which of these represents redox reaction?

- A. $AgNO_3 + NaCl \rightarrow AgCl + NaNO_2$
- B. $H_2S + Pb(NO_3)_2 \rightarrow PbS + 2HNO_3$
- C. $CaCO_3 \rightarrow CaO + CO_2$
- D. $Zn + 2HCl \rightarrow ZnCl_2 + H_2$

9. The acid that is used to remove rust is

- A. boric
- B. trioxonitrate (V)
- C. hydrochloric
- D. tetraoxosulphate (VI)

10. A compound commonly used for the sterilization and preservation of specimens and food is

- A. ethanol
- B. benzene
- C. ether
- D. ammonia

11. The relative atomic mass of a naturally occurring lithium consisting of 90% Li and 10% Li is

- A. 6.9
- B. 7.1
- C. 6.2
- D. 6.8

12. Which of the allotropes of carbon is a constituent of a lead pencil?

- A. Graphite
- B. Diamond
- C. Lampblack
- D. Soot

13. Coffee stains can best be removed by

- A. turpentine
- B. kerosene
- C. a solution of borax in water
- D. ammonia solution

14. Iron can be prevented from corrosion by coating the surface with

- A. gold
- B. silver
- C. zinc
- D. copper

15. Substances used as drying agents are usually

- A. amphoteric
- B. acidic
- C. hygroscopic
- D. efflorescent

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ANSWERS TO 2017/2018 CHEMISTRY QUESTIONS

1. A 2. C 3. B 4. E 5. A 6. C 7. B 8. D 9. D

10. A 11. A 12. A 13. C 14. C 15. C

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CHEMISTRY 2017/2018 QUESTIONS [SESSION 2]**COMPUTER BASED TEST (CBT)**

1. Which of the following is used to hasten the ripening of fruits?

- A. Ethanol
- B. Ethene
- C. Ethyne
- D. Ethane

2. The products of the combustion of candle wax are

- A. hydrogen and water
- B. oxygen and water
- C. carbon(IV) oxide and water
- D. carbon(II)oxide and water

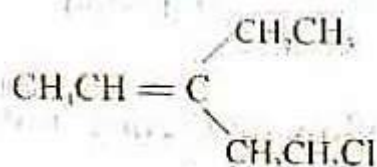
3. In the electrolytic extraction of aluminium the function of the molten cryolite to

- A. precipitate aluminium hydroxide
- B. lower the melting point of aluminium oxide.
- C. act as raw material.
- D. act as a solvent

4. A suitable solvent for iodine and naphthalene is

- A. benzene
- B. ethanol
- C. water
- D. carbon(IV) sulphide

5. What is the I-UPAC name of the hydrocarbon



- A. 1-chloro-3-ethylpent-3-ene
- B. 5-chloro-3-ethylpent-2,3-ene
- C. 5-chloro-3-ethylpent-2-ene
- D. 1-ethyl-1-chlorobethylpropene

6. Which of the following molecules is not linear in shape?

- A. CO₂
- B. O₂
- C. NH₃
- D. HCl

7. Which of the following reactions do alkenes undergo?

- A. Addition reaction
- B. Elimination reaction

- C. Condensation reaction
- D. Substitution reaction

8. Which of the following arrangements is in order of decreasing electro positivity?

- A. Fluorine, Boron, Beryllium, Nitrogen, Lithium
- B. Lithium, Beryllium, Boron, Nitrogen, Fluorine
- C. Fluorine, Nitrogen, Boron, Beryllium, Lithium
- D. Lithium, Nitrogen, Boron, Fluorine, Beryllium

9. How much heat will be liberated if 10g of hydrogen burns in excess oxygen according to the following thermochemical equation?



- A. -1430kJ
- B. -2860 kJ
- C. -572 kJ
- D. -286kJ

10. What type of bond exist between an element with atomic number 12 and Y with atomic number 17?

- A. Electrovalent
- B. Covalent
- C. Metallic
- D. Dative

11. Which of the following is an example of a mixture

- A. Common salt
- B. Washing soda
- C. Sand
- D. Blood

12. Which of following is correct of the change in oxidation number of phosphorus from 4P to 2P₂O₅?

- A. 0 to +5
- B. 0 to +2
- C. 4 to +5
- D. 4 to -2

13. Two 50cm³ cylinders I and II contain hydrogen and oxygen respectively at the same temperature and pressure. If there are 3.0 moles of oxygen then the mass of hydrogen is

- A. 3g
- B. 6g
- C. 9g

D. 12g

14. A good method of cleaning up freshly-spilled oil which has not spread over a large surface of water is by

- A. spraying with hot water
- B. dispersal with compressed air
- C. burning off the oil layer
- D. disinfection with chlorine

15. Hardness of water is mainly due to the presence of

- A. calcium hydroxide or magnesium hydroxide
- B. calcium trioxocarbonate (IV) or calcium tetraoxosulphate (VI)
- C. sodium hydroxide or magnesium hydroxide
- D. calcium chloride or sodium chloride salts

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ANSWERS TO CHEMISTRY 2017/2018 (SESSION 2)

1. B 2. C 3. B 4. B 5. C 6. C 7. A 8. B 9. A
10. A 11. D 12. A 13. B 14. C 15. B

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USE OF ENGLISH 2018/2019 QUESTIONS

COMPUTER BASED TEST (CBT)

Instructions: There are 17 questions in this section. You are expected to answer 15 questions only.

In each of questions 1 to 5, choose the option nearest in meaning to the word(s) in italics.

1. Mr Sam is a **dominant** partner in our industry.

- A. An important
- B. An influential
- C. An outstanding
- D. A prominent

2. In spite of the statement credited to some government officials, we still have our **misgivings** about their real intentions.

- A. fears
- B. distrust
- C. anxiety
- D. objectives

3. Modesty is one of our teacher's most **salient** characteristics.

- A. provoking
- B. attractive
- C. prominent
- D. useful

4. We all praised the student's leaders for their **intrepid** stand during the crisis.

- A. fearless
- B. cheerful
- C. reasonable
- D. impressive

5. The chairman's reaction was a **storm** in a tea cup.

- A. suitable for the occasion
- B. less serious than it appeared to be
- C. more serious than necessary
- D. greatly diminished in scope

In the questions 6 to 12, choose the word or expression which best completes each sentence.

6. He behaves as if he _____ a governor.

- A. is
- B. was
- C. were

D. are

7. The chairman did not take kindly to the _____ remarks about his policy.

- A. abusive
- B. dishonourable
- C. derisive
- D. derogatory

8. Although I am watching television, I _____ what you are saying.

- A. am hearing
- B. can hear
- C. have heard
- D. was hearing

9. The policemen who were to keep watch connived _____ the robber's escape.

- A. with
- B. at
- C. to
- D. for

10. We used to serve tea in this canteen but _____ the cost of milk has become very exorbitant.

- A. recently
- B. nowadays
- C. presently
- D. lately

In each of questions 11 to 13, choose the word that has the same vowel sound as the one represented by the letter(s) underlined.

11. Tyranny

- A. high
- B. dye
- C. myth
- D. myopia

12. Success

- A. suffer
- B. rubbish
- C. punish
- D. suggest

13. legal

- A. many
- B. margin
- C. mineral
- D. rally

In each of questions 14 and 15, choose the word that has a different stress patten from the others.

- 14.A. generous
- B. legalize
- C. factious
- D. hazardous

- 15.A. misapply
- B. localize
- C. tetanus
- D. ludicrous

In the questions 16 and 17, choose the word or expression which best completes each sentence.

16. Effiong can't kill a snake, ____?

- A. can't she
- B. could she
- C. isn't it
- D. can she

17. The hunter, with his dog ____ entering the bush.

- A. are
- B. was
- C. is
- D. were

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ANSWERS TO 2018/2019 USE OF ENGLISH

- 1. A 2. B 3. C 4. A 5. C 6. C 7. D 8. B 9. B
- 10. B 11. C 12. D 13. C 14. C 15. A 16. D
- 17. C

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PHYSICS 2018/2019 QUESTIONS

Instruction: There are 17 questions in this section. You are expected to answer 15 questions only.

1. If a man is standing between two parallel plane mirrors with their reflecting surfaces facing each other, how many images of the man will be formed?

- A. 8.
- B. 2
- C. 4
- D. infinite

2. In the Hare's apparatus, water rises to a height of 26.5cm in one limb. If a liquid rises to a height of 20.4 cm in the other limb, what is relative density of the liquid?

- A. 0.8
- B. 1.1
- C. 1.2
- D. 1.3

3. A p-n junction diode is used as_____.

- A. a rectifier in a d.c circuit
- B. an amplifier in an a.c circuit
- C. a rectifier in an a.c circuit
- D. an amplifier in a d.c circuit

4. The sharpness of the boundaries of the shadow of an object is determined by the _____.

- A. rays of light passing through the object
- B. intensity of light striking the object
- C. opacity of the object
- D. nature of the object

5. A body of mass 4kg is acted on by a constant force of 12N for 3 seconds. The kinetic energy gained by the body at the end of the time is_____.

- A. 162J
- B. 144J
- C. 72J
- D. 81J

6. Two inductors of inductances 4H and 8H are arranged in series and a current of 10 A is passed through them. What is the energy stored in them?

- A. 500J
- B. 50 J
- C. 133J
- D. 250J

7. Which of the following will be applied when a metal Y is used to electroplate another metal X in electrolysis?

- A. Y is the anode and very high current is used
- B. X is the anode and Y is the cathode
- C. Y is the cathode and X is the anode
- D. X is the anode and very high current is used

8. If a tube of small radius opened at both ends is placed in a liquid, the liquid will_____.

- A. fall below the liquid level if the liquid does not wet the glass
- B. rise above the liquid level if the liquid does not wet the glass
- C. remain at the same level irrespective of whether the liquid wets the glass or not
- D. fall below the liquid level if the liquid wets the glass

9. A stone and a feather are dropped from the same height above earth surface.

Ignoring resistance, which of the following is correct?

- A. The feather will be blown away by the wind while the stone will drop steadily
- B. The stone and feather will both reach the ground at the same time
- C. The feather will reach the ground first
- D. The stone will reach the ground first

10. An air bubbles rises from the bottom to the top of a water dam which is 40 m deep.

The volume of the bubble just below the surface is 2.5 cm^3 . Find its volume at the bottom of the dam, if atmospheric pressure is equivalent to 10 m of water.

- A. 2.0 cm^3
- B. 1.6 cm^3
- C. 0.625 cm^3
- D. 0.5 cm^3

11. When equal weights of iron and water are subjected to an equal supply of heat, it is found that the piece of iron becomes much hotter than water after a shorter time because_____.

- A. the specific heat of iron is higher than that of water
- B. iron is in solid form
- C. water is in liquid form
- D. the specific heat of water is higher than that of iron

E. the specific heat of iron is infinite

12. Of two identical tuning forks with natural frequency 256Hz, one is loaded so that 4 beats per seconds are heard when they are sounded together. What is the frequency of the loaded tuning fork?

- A. 260Hz
- B. 252 Hz
- C. 248 Hz
- D. 246 Hz

13. Radio waves have a velocity of 3×10^8 m/s. A radio station sends out a broadcast on a frequency of 800KHz. The wavelength of the broadcast is _____.

- A. 240.0 m
- B. 267.0m
- C. 375.0 m
- D. 37.5 m
- E. 26.7 m

14. A narrow beam of white light can be split up into different colours by a glass prism. The correct explanation is that_____.

- A. white light is an electromagnetic wave
- B. the prism has all the colours of the white light
- C. white light has undergone total internal reflection in the prism
- D. different colours of white light travel with different speeds in glass

15. Two forces whose resultant is 100N, are at right angles to each other. If one of them makes an angle of 30° with the resultant, determine its magnitude.

- A. 8.66N
- B. 50.0N
- C. 57.7N
- D. 86.6N

16. A conductor of length 2m carries a current of 0.8 A while kept in magnetic field of magnetic flux density 0.5 T. The maximum force acting on it is _____.

- A. 8.0 N
- B. 3.2 N
- C. 0.8 N
- D. 0.2 N

17. A heavy object is suspended from a string and lowered into water so that is completely submerged. The object appears lighter because_____.

- A. the density of water is less than that of the object

B. the pressure is low just below the water surface

C. it experiences an up thrust

D. the tension in the string neutralizes part of the weight

ANSWERS TO 2018/2019 PHYSICS QUESTIONS

1. D 2. D 3. C 4. B 5. A 6. C 7. A 8. A 9. B

10. D 11. D 12. A 13. C 14. D 15. D 16. C

17. C

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CHEMISTRY 2018/2019 QUESTIONS

Instructions: There are 17 questions in this section. You are expected to answer 15 questions only.

1. Which of the following ions is isoelectronic with neon? [3Li, 9F, 10Ne, 17Cl, 19K]

- A. Cl⁻
- B. F⁻
- C. K⁺
- D. Li⁺

2. Which of the following gases is employed as an anaesthesia?

- A. NH₃
- B. NO
- C. N₂O
- D. NO₂

3. Aluminium is extracted commercially from its ore by ____.

- A. heating aluminium oxide with coke in a furnace
- B. the electrolysis of fused aluminium oxide in cryolite
- C. treating cryolite with sodium hydroxide solution under pressure
- D. heating sodium aluminium silicate to a high temperature

4. The atomic number of Caesium is 55 and its atomic mass is 133. The nucleus of Caesium atom therefore contains ____.

- A. 78 protons and 55 electrons
- B. 55 protons and 78 neutrons
- C. 55 neutrons and 78 electrons
- D. 78 neutrons and 55 neutrons

5. The solubility in moles per dm³ of 20g of CuSO₄ dissolved in 100g of water at 180°C is ____.

- A. 0.13
- B. 0.25
- C. 1.25
- D. 2.00

[Cu=63.5, S=32, O-16]

6. Sodium hydroxide should be stored in properly closed containers because it ____.

- A. readily absorbs water vapour from the air
- B. is easily oxidized by atmospheric oxygen
- C. turns golden yellow when exposed to light
- D. melts at low temperature

7. $2\text{H}_2\text{S}_{(g)} + \text{SO}_{2(g)} \rightarrow 3\text{S}_{(g)} + 2\text{H}_2\text{O}_{(l)}$.

The above reaction is ____.

- A. a redox reaction in which H₂S is the oxidant and SO₂ is the reductant
- B. a redox reaction in which SO₂ is the oxidant and H₂S is the reductant
- C. not a redox reaction because there is no oxidant in the reaction equation
- D. not a redox reaction because there is no reductant in the reaction equation

8. How many unpaired electrons are in the p-orbitals of a fluorine atom?

- A. 1
- B. 2
- C. 3
- D. 0

9. A metal M displaces zinc from ZnCl₂ solution. This shows that ____.

- A. electrons flow from zinc to M
- B. M is more electropositive than zinc
- C. M is more electronegative than zinc
- D. zinc is more electropositive than M

10. Which of the following relationships between the pressure P, the volume V and the temperature T, represents an ideal gas behaviour?

- A. $P \propto VT$
- B. $P \propto \frac{T}{V}$
- C. $PV \propto \frac{1}{T}$
- D. $PT \propto V$

11. Increasing the pressure of a gas, ____.

- A. lowers the average kinetic energy of the molecules
- B. decreases the density of the gas
- C. decreases the temperature of the gas
- D. increases the density of the gas
- D. increases the volume of the gas

12. A quantity of electricity liberates 3.6g of silver from its salt. What mass of aluminium will be liberated from its salt by the same quantity of electricity?

- A. 2.7g
- B. 1.2 g
- C. 0.9 g
- D. 0.3 g

13. The Avogadro's number of 24g of magnesium is the same as that of ____.

- A. 1g of hydrogen molecules
- B. 16g of oxygen molecules
- C. 32g of oxygen molecules
- D. 35.5 g of chlorine molecules

14. Which of the following is arranged in order of increasing electronegativity?

- A. chlorine, aluminium, magnesium, phosphorus, sodium
- B. sodium, magnesium, aluminium, phosphorus, chlorine
- C. chlorine, phosphorus, aluminium, magnesium, sodium
- D. sodium, chlorine, phosphorus, magnesium, aluminium

15. Fluorine does not occur in the free state in nature because_____.

- A. it is inert
- B. of its high reactivity
- C. it is a poisonous gas
- D. it belongs to the halogen family

16. Which of the following gases has characteristic pungent smell, turns red litmus paper blue and forms dense white fumes with hydrogen chloride gas>

- A. N₂
- B. N₂O
- C. Cl₂
- D. NH₃

17. One of the most commonly determined chemical parameters of water quality is_____.

- A. temperature
- B. suspended solids
- C. biochemical oxygen demand
- D. turbidity

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ANSWERS TO 2018/2019 CHEMISTRY

1. B 2. C 3. B 4. B 5. C 6. A 7. B 8. A 9. B

10. B 11. D 12. D 13. C 14. B 15. B 16. D

17. C

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